

DOS 3.30

# Reference (Abridged)

by IBM Corp. and Microsoft, Inc.

**Programming Family**

**IBM**

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1987, 1988

**First edition (February 1987)**

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# About This Book

## Terms Used

The terms “diskette,” “fixed disk,” and “disk” are used throughout this book. Where “diskette” is used, it applies only to diskette drives and diskettes. Where “fixed disk” is used, it applies only to the IBM nonremovable fixed disk drive. Where “disk” is used, it applies to both fixed disks and diskettes.

The terms “source” and “target” are used to describe diskettes and drives. The source refers to the original drive, and the target refers to the new drive.

The terms “local” and “remote” describe the location of a disk, directory or printer relative to your computer. A local disk, directory, or printer is on *your* computer. A remote disk, directory, or printer is on a *network* computer.



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# Chapter 1. Introduction

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## Types of Diskette Drives

The following chart shows the types of diskette drives your IBM Personal Computer can have.

Size (inches)	Description	Capacity (bytes)
5.25	Single-sided	160KB/180KB
5.25	Double-sided	320KB/360KB
5.25	High-capacity	1.2MB
3.5	Double-sided	720KB
3.5	Double-sided	1.44MB

## Types of Diskettes

The following chart shows the types of diskettes used to read and write information.

Size (inches)	Description	Capacity (bytes)
5.25	Single-sided, double-density	160KB/180KB
5.25	Double-sided, double-density	320KB/360KB
5.25	High-capacity, double-density	1.2MB
3.5	Double-sided	720KB
3.5	Double-sided	1.44MB

A single-sided, double-density diskette (160KB/180KB) contains 40 tracks, 8 or 9 sectors per track, and 512 bytes per sector.

A double-sided, double-density (320KB/360KB) diskette contains 40 tracks per side, 8 or 9 sectors per track, and 512 bytes per sector.

A high-capacity, double-density diskette (1.2MB) is a double-sided diskette that contains 80 tracks per side, 15 sectors per track, and 512 bytes per sector.

A double-sided diskette (720KB) contains 80 tracks per side, 9 sectors per track, and 512 bytes per sector.

A double-sided diskette (1.44MB) contains 80 tracks per side, 18 sectors per track, and 512 bytes per sector.

## Diskette and Drive Compatibility

Some combinations of diskettes and drive types are not compatible for reading and writing. You need to consider diskette and drive compatibility when you use DOS commands that read and write to diskettes. This section describes which diskette and drive combinations *are* allowed.

### Single-Sided Drives 160KB/180KB (5.25 inch)

You can read and write to:  
160KB/180KB single-sided, double-density diskettes

### Double-Sided Drives 320KB/360KB (5.25 inch)

You can read and write to:  
160KB/180KB single-sided, double-density diskettes  
320KB/360KB double-sided, double-density diskettes

### 1.2MB High-Capacity Drives (5.25 inch)

You can read and write to:  
160KB/180KB single-sided, double-density diskettes\*  
320KB/360KB double-sided, double-density diskettes\*  
1.2MB high-capacity, double-density diskettes

**\* IMPORTANT:** If you write on any of these diskette types using a high-capacity drive, you may not be able to read the diskettes in a single-sided or double-sided drive.

You need to consider diskette and drive compatibility when you use DOS commands that read and write to diskettes. For example, the FORMAT command contains a section called "FORMAT Compatibility." Read the section about compatibility before using the command.

### **720KB Double-Sided Drives (3.5 inch)**

You can read and write to:

- 720KB double-sided diskettes

### **1.44MB Double-Sided Drives (3.5 inch)**

You can read and write to:

- 720KB double-sided diskettes
- 1.44MB double-sided diskettes

#### **Note:**

\* **720KB and 1.44MB diskettes** cannot be inserted into a 160KB/180KB, 320KB/360KB, or a 1.2MB high-capacity drive.

## **About Messages**

You may get messages on your screen when you use DOS commands. If you get a message and need help, refer to “Messages” in Appendix A for the *explanation* of the message and the *action* you should take.

## Chapter 2. Preparing Your Fixed Disk

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## Introduction

# Replacing a Previous Version of DOS

Use the REPLACE command to replace previous versions of DOS with DOS 3.30. For information on the REPLACE command see Chapter 7.

1. Insert your DOS Start-Up Diskette into drive A.
2. Press the Ctl—Alt and Del keys to start DOS.
3. After entering the date and time, type the following and press Enter:

```
sys c:
```

This transfers the 3.30 System files to the fixed disk.

4. To replace existing DOS files on your fixed disk, type the following and press Enter:

```
replace a:\*.* c:\ /s /r
```

5. To add the new DOS 3.30 files, type the following and press Enter:

```
replace a:\*.* c:[path] /a
```

**Note:** *[path]* is the path to the subdirectory that contains your DOS program files. This parameter is optional.

6. Remove your DOS Start-Up Diskette from drive A.
7. Insert the DOS Operating Diskette into drive A.
8. To replace existing DOS files on your fixed disk, type the following and press Enter:

```
replace a:\*.* c:\ /s /r
```

9. To add the new DOS 3.30 files, type the following and press Enter:

```
replace a:\*.* c:[path] /a
```

## Network Information

When using the IBM PC Network program 1.00 or the IBM PC LAN program 1.10, make all files in the shared DOS directory read-only. To make these files read-only type the following and press Enter.

```
attrib +r c:[path]\*.*
```

Replace *path* with the path from the root to the desired directory. If the IBM PC Network or the IBM PC LAN Program Installation Aid was used to install the network, *path* will be "APPS\DOS."



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# COUNTRY

## Command

---

**Purpose:**

Use to specify the date, time, collating sequence, capitalization, and folding format for a given country. Other information, such as the currency symbol and the decimal separator for a particular country, is also set using the COUNTRY command.

**Note:** COUNTRY does not translate the text of DOS messages for the country you specify.

**Format:**

COUNTRY = *xxx*,*[yyy]*,*[d:]filename[.ext]*

or

COUNTRY = *xxx*,*[yyy]*

**Remark:**

*xxx* is the 3 – digit international country code for the telephone system. The countries listed (see Appendix B) are supported for DOS Version 3.30. If your country is not listed, choose the most similar country supported.

*yyy* is the code page of the desired country information. A single country may have different information based on the selected code page. Each country has two code pages. *yyy* specifies which of the two to use. The default for the code page is country dependent. Refer to Appendix C in this book, to select a specific code page.

*[d:]filename[.ext]* specifies the COUNTRY information file.

# COUNTRY

## Command

The normal name of this file is COUNTRY.SYS, but you may choose to call it another name. It is highly recommended that you provide a complete path to this file. See the following example:

```
c:\dos\country.sys
```

**Note:** If no COUNTRY= statement is in the CONFIG.SYS file the default country code is 001, the default code page is 437 and the default country information file is \COUNTRY.SYS.

### Examples:

To specify the date and time format for the United States, include the following command in the CONFIG.SYS file:

```
country=001 437 c:\country.sys
```

The next time you start DOS, the date format is *mm-dd-yy*, the time format is *hh:mm:ss*, the decimal separator is a period (.), and the currency symbol is \$.

This example assumes that the file COUNTRY.SYS is installed in the root directory of the C: drive.

You can omit the code page in your COUNTRY command such as:

```
country=001,,c:\country.sys
```

the system will use the default code page for the country. For the above example, the code page 437 would be used.

# COUNTRY

## Command

You also can omit the country information file such as: \_\_\_\_\_

```
country=001
```

the system assumes COUNTRY.SYS file exists in the root directory of the current drive.

## DEVICE Command

---

**Purpose:**

Allows you to specify the name of a file containing a device driver.

**Format:**

DEVICE = [d:][path]filename[.ext]

**Remark:**

During startup, DOS loads the file into memory and gives it control as described in “Installation of Device Drivers” in Chapter 2 of *DOS Technical Reference*. Please refer to that section for technical information about installable device drivers.

## DISPLAY.SYS

**Purpose:**

Allows you to use code page switching on the IBM PC Convertible LCD screen, EGA, and IBM Personal System/2 displays.

**Note:** The U.S. user normally does not need to use DISPLAY.SYS. To determine if you need to use this device driver, refer to Chapter 9, “Code Page Switching.”

If you are using ANSI.SYS with DISPLAY.SYS, the DEVICE=ANSI.SYS statement must appear before the DEVICE=DISPLAY.SYS statement in the CONFIG.SYS file.

# DEVICE Command

**Format:**

DEVICE = [*d*:[*path*]DISPLAY.SYS CON[:] =  
(*type*[[*hwcp*][*n*]])

or

DEVICE = [*d*:[*path*]DISPLAY.SYS CON[:] =  
(*type*[[*hwcp*][*(n,m)*]])

**Remark:**

*type* specifies the display adapter type. The display types are MONO, CGA, EGA, and LCD.

**Note:** The display type EGA supports the Enhanced Graphics Adapter and IBM Personal System/2. The IBM Personal System/2 video support is not functionally equivalent to EGA video support.

*hwcp* specifies the code page supported directly by the hardware. The possible *hwcp* values are 437, 850, 860, 863, and 865. Refer to Appendix C for a description of these code pages.

*n* specifies the number of additional codes that can be supported. This value is referred to as the number of prepared code pages. The allowable range of additional code pages *n* must be between 0 and 12. Refer to the table on the following page for the default values of *n*.

**Note:** The MONO and CGA cannot support prepared code pages. The value of *n* must be 0.

Each prepared code page requires a buffer in DISPLAY.SYS which hold the corresponding character fonts.

*m* specifies the number of sub-fonts supported for each code page. These sub-fonts vary for different adapters and display modes. If the value of *m* is not specified then the default is the maximum number of sub-fonts:

## DEVICE Command

Devices	Font size	Default m
EGA	8 x 8    8 x 14	2
IBM Personal System/2 Displays	8 x 8    8 x 16	2
IBM PC Convertible LCD	8 x 8	1



## DEVICE Command

The following table is a compiled list of parameters for DISPLAY.SYS:

Type	Actual Device	Default n	n	m	Default m
CGA	● Color Graphics Adapter	0	0	0	0
MONO	● Monochrome/Printer Adapter	0	0	0	0
EGA	● Enhanced Graphics Adapter	1	1-12	1-2	2
	● IBM Personal System/2	1	1-12	1-2	2
LCD	IBM PC Convertible	1	1-12	1	1

The number of additional code page values may cause a buffer to be used to hold the image data. The size of this buffer is dependent on the display type. For example:

```
device=c:\dos\display.sys con:=(ega,437,2)
```

installs the code page switching support for the CON: device. It also tells the CON: driver that the display is an Enhanced Graphics Adapter with the 437 code page built in. The CON driver holds up to two code pages prepared by the use of the MODE command. See the MODE command, in Chapter 7 for additional information.

For additional information, refer to the NLSFUNC command in chapter 7 in this book.

# DEVICE

## Command

### PRINTER.SYS

#### Purpose:

Allows you to use code page switching on the IBM Proprinter Model 4201 and IBM Quietwriter III Printer Model 5202.

**Note:** The U.S. user normally does not need to use PRINTER.SYS. To determine if you need to use this device driver, refer to Chapter 9, "Code Page Switching."

#### Format:

DEVICE = [*d:*][*path*]PRINTER.SYS LPT#[*:*] =  
(*type*[[*hwcp*][*n*]])

or

DEVICE = [*d:*][*path*]PRINTER.SYS LPT#[*:*] =  
(*type*[[*(hwcp1,hwcp2,...)*][*n*]])

#### Remark:

LPT# specifies the printer device and can be entered up to three times, one for printers LPT1, LPT2, and LPT3. The device name PRN may be used in place of LPT1.

*type* specifies one of the following printer types:

- IBM Proprinter Model 4201
- IBM Quietwriter III Printer Model 5202

*hwcp* specifies the code page image built into the hardware (437, 850, 860, 863, or 865).

For the IBM Quietwriter III Printer Model 5202, the *hwcp* can be one code page, such as 437, or it can be a pair of code pages, such as (437,850). For the IBM Quietwriter III Printer Model 5202, if two hardware code pages have been specified, then no code pages can be prepared, and the value of *n* must equal zero.

## DEVICE Command

*n* specifies the number of additional code pages that can be prepared. The value of *n* determines the number of buffers PRINTER.SYS will set up to hold code pages being prepared. The maximum number of code pages that can be prepared is 12.

The IBM Proprinter Model 4201 holds its hardware code page in ROM. When the IBM Proprinter Model 4201 is started, it copies the ROM code page into a RAM area in the printer. If a zero value is chosen for *n*, or *n* is not specified, PRINTER.SYS will still be able to prepare the IBM Proprinter Model 4201 with one code page by moving it from the 4201.CPI file directly into the RAM area in the printer.

The IBM Quietwriter III Printer Model 5202 supports font cartridges of different code pages but of the same sets of type styles. New code pages are prepared by physically changing the font cartridge. DOS 3.30 cannot tell from the printer if a font cartridge has been changed. If two code pages are specified for *hwcp*, DOS 3.30 assumes that the images of the code pages are permanently installed on the printer, and there will be no code page preparation required.

For example:

```
device=printer.sys lpt1:=(4201,437,1)
lpt2=(5202,437,0)
```

installs the code page switching support for the LPT1: and LPT2: devices. It instructs the LPT1: driver that the printer is a IBM Proprinter Model 4201 and the LPT2: driver that the printer is a IBM Quietwriter III Printer Model 5202. Both printers have the 437 code page built in. The LPT1: driver is able to hold one code page prepared by the MODE command, while the LPT2: driver can have one code page prepared. For additional information, refer to the MODE command in chapter 7 in this book.

**Note:** A MODE prepare or MODE select should never be done while data is being printed by the PRINT command.

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## Chapter 4. DOS Commands

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# CHCP (Change Code Page) Command

---

**Purpose:**

Selects the code page that DOS will use and selects that code page for as many devices as possible. This is a system level command, while MODE is a device level command.

**Format:**

CHCP [*nnn*]

**Type:**

Internal External

\*\*\*

**Remark:**

Specify the parameters:

[*nnn*] to specify the desired code page. If omitted, the operating system code page is displayed.

**Notes:**

1. The NLSFUNC command must be loaded prior to issuing the CHCP command. See the NLSFUNC command in this chapter.
2. If a device driver has not been prepared for the requested code page, CHCP cannot select the code page for that device. Refer to the MODE command in this chapter.

## CHCP (Change Code Page) Command

3. This command may need to access the COUNTRY.SYS file. If the file cannot be found, a **File not found** message is displayed. Using the COUNTRY= statement in the CONFIG.SYS file or the NLSFUNC command, you can tell DOS where to find COUNTRY.SYS.

For information on code page switching, see Chapter 9.



# COPY

## Command

---

**Purpose:**

Copies one or more files to the specified disk.

**Format:**

COPY [/A]/B[d:][path]filename[.ext][[/A]/B]

[d:][path][filename[.ext]][[/A]/B]/V

or

COPY [/A]/B[d:][path]filename[.ext][[/A]/B]

[ + [d:][path]filename[.ext][[/A]/B] . . . ]

[d:][path][filename[.ext]][[/A]/B]/V

**Type:**

Internal External

\*\*\*

**Remark:**

The first file specified is the source file. The second file specified is the target file. If the second parameter is a directory (*path* with no file name), files are copied into that directory without changing their names.

**Note:** COPY is not the same as BACKUP. Use BACKUP or XCOPY if you want all files including subdirectories. COPY only copies files from the current or specified directory.

COPY also copies files to the same disk. In this case, you *must* give the copies different names unless different directories are specified; otherwise, the copy is not permitted. Concatenation (combining of files) can be performed during the copying process.

# **COPY**

## **Command**

You can also use **COPY** to transfer data between any of the system devices. An example of how to copy information that you type at the keyboard to a file is provided at the end of the description of **COPY Option 2**.

Specify **/V** to cause DOS to verify that the sectors written on the target diskette are recorded properly. Although errors in recording data are very rare, this option has been provided for those of you who wish to verify that critical data has been correctly recorded. This option causes the **COPY** command to run more slowly, due to the additional overhead of verification.

The **/V** parameter provides the same check as does the **VERIFY ON** command. **/V** is redundant if the **VERIFY ON** command has been executed previously. The difference is that **/V** is effective only during the duration of the **COPY** command. The **VERIFY ON** command is in effect until **VERIFY OFF** is entered.

The parameters **/A** and **/B** indicate the amount of data to be processed by the **COPY** command. Each applies to the filespec preceding it and to all remaining filespecs on the command line until another **/A** or **/B** is encountered. These parameters have the following meanings:

# COPY

## Command

When used with a *source* filespec:

- /A Causes the file to be treated as an ASCII (text) file. The file's data is copied up to, but not including, the first end-of-file character (Ctrl-Z, which is 1AH) found in the file the remainder of the file is not copied.
- /B Causes the entire file (based on the directory file size) to be copied.

When used with a *target* filespec:

- /A Causes a Ctrl-Z character to be added as the last character of the file.
- /B Causes no end-of-file character (Ctrl-Z) to be added.

The default values are /A when concatenation is being performed (see Option 3 below), and /B when concatenation is not being performed (Options 1 and 2).

### Notes:

1. When copying to or from a reserved device name, the copy is performed in ASCII (/A) mode. The first Ctrl-Z character encountered will end the copy unless /B was specified.
2. If you make a copy of a file that is marked read-only, the copy will not be marked read-only.
3. You cannot use COPY to transfer a file between computers using serial ports.

You can use the global characters ? and \* in the file name and in the extension parameters of both the source and target files. If you type a ? or \* in the source *filespec*, the names of the files will be displayed as the files are being copied. For more information about global characters, refer to "Global File Name Characters" in Chapter 2.

# COPY

## Command

The COPY command has three format options:

### Option 1 - Copy with Same Name

Use this option to copy a file with the target file having the *same* file name and extension as the source file. For example:

```
COPY [d:][path]filename[.ext]
```

or

```
COPY [d:][path]filename[.ext] d:[path]
```

In the first example, we want to copy a file to the current directory of the default drive. In the second example, we specify the target drive and/or directory. In both examples, because we did not specify the second file name, the copied file will have the same file name as the source file. Because we did not specify a name for the second file, the source drive and the target drive must be different unless different directories were specified or implied; otherwise, the copy is not permitted.

For example, assume the default drive is A. The command:

```
B>copy b:myprog
```

copies the file MYPROG from drive B to the current directory on the default drive A, with no change in the file name.

## COPY Command

The command:

```
A>copy *.* b:
```

copies all the files in the current directory from the default drive A to drive B, with no change in the file names or in the extensions. The file names are displayed as the files are copied. This method is very useful if the files on drive A are fragmented. The command:

```
A>copy b:\myprog b:\level1
```

copies the file MYPROG from the root directory of drive B to the directory path:

```
\level1
```

on the same drive. The copy has the same file name as the original file. Note that the above example assumes that directory \LEVEL1 exists on drive B. If it did not, then the file MYPROG would have been copied into a file named LEVEL1 in the root directory of drive B. In other words, if the second parameter specifies a directory that exists, the file (or files) will be placed in that directory, keeping the same file name. If the second parameter does not specify a directory that exists, DOS will treat it as a file name.

# COPY

## Command

### Option 2 - Copy with Different Name

Use this option when you want the copied file to have a different name from the file being copied. For example:

```
COPY [d:][path]filename[.ext][path]  
filename[.ext]
```

or

```
COPY [d:][path]filename[.ext] d:[path]  
filename[.ext]
```

In the first example, we copied a file (first file specified), and renamed the copy (second file specified). We did not specify a drive, so the default drive was used. In the second example, we copied a file and renamed the copy also. In this example, we did specify the target drive. Because we changed the name of the file, the source drive and the target drive do not have to be different. The current directory can be the same or different.

For example:

```
A>copy myprog.abc b:*.xxx
```

copies the file MYPROG.ABC from the diskette in the default drive to drive B, naming the copy MYPROG.XXX. The current directory of each drive was used.

## COPY Command

You can also use reserved device names for the copy operation.  
For example:

```
copy con filea
copy con aux
copy con lpt1
copy filea con
copy fileb aux
copy filec lpt2
copy aux lpt1
copy aux con
```

Also, NUL can be used in any variation.

Refer to “DOS Device Names” in Chapter 2 for information about system devices.

This example shows how to use COPY to put what you type from the keyboard into a file:

```
copy con filea
```

Type a line and press Enter.

Type your next line and press Enter.

.

:

.

Type your last line and press Enter.

Now, press F6 and then press Enter.

When you press F6, and then press Enter, the COPY operation ends and saves the information you entered. In this example, the information is saved in a file named FILEA.

**Note:** This example assumes that you have not altered the meaning of F6 through the “Extended Screen and Keyboard Control” functions described in Chapter 3 of the *DOS Technical Reference*. If you have, then substitute the key that you have assigned Ctrl-Z for F6 in this example..

# COPY

## Command

### Option 3 - Copy and Combine Files.

Use this option when you want to combine files while copying. That is, you can combine two or more files into one file by adding the additional files to the end of the first. The message indicating the number of files copied refers to the number of result files created.

To combine files, list any number of source files, separated by plus (+) signs in the COPY command. Use the following format:

COPY [/A][/B][d:][path]filename[.ext][[/A][/B]

[+ [d:][path]filename[.ext][[/A][/B] . . . ]

[d:][path][filename[.ext]][[/A][/B][/V]

For example:

```
copy a.xyz+b.abc+b:c.txt bigfile.txt
```

This command creates a new file called BIGFILE.TXT in the current directory of the default drive. The combination of A.XYZ, B.ABC, and B:C.TXT is put into BIGFILE.TXT.

If you do not specify a resultant *filename*, the additional files are added to the end of the first file (assuming the first file already exists), leaving the result in the first file. For example,

```
copy a.asm+b.asm
```

In this case, COPY appends B.ASM to the end of A.ASM and leaves the result in a file called A.ASM in the current directory of the default drive.

**Note:** Combining files is normally performed in text (or ASCII) mode. That is, the first Ctrl-Z (hex 1A) character in the file is interpreted as an end-of-file mark. To combine binary files, use the /B parameter to



## COPY Command

force COPY to use the physical end – of – file (the file length shown in the DIR command).

You can also combine ASCII and binary files by using the following parameters:

- ASCII - /A
- Binary - /B

For example,

```
copy a.xyz+b.com/b+b:c.txt/a bigfile.txt
```

A /A or /B takes effect on the file it is placed after, and it applies to all subsequent files on the command line until another /A or /B is found. A /A or /B on the result file causes a Ctrl-Z to be added (/A), or not to be added (/B), as the last character in the result file.

You can use the global characters ? and \* in the file names of both the files to be combined and the result file. For example:

```
copy *.lst combin.prn
```

In this example, all files matching \*.LST are combined into one file called COMBIN.PRN in the current directory of the default drive.

## **COPY**

### **Command**

The following example:

```
copy *.lst+*.ref combin.prn
```

combines all files matching \*.LST and then all files matching \*.REF into one file called COMBIN.PRN in the current directory of the default drive.

In the following example:

```
copy *.lst+*.ref *.prn
```

each file matching \*.LST combines with the corresponding .REF file, with the result having the same name but with extension .PRN. Thus, a file FILE1.LST would be combined with FILE1.REF to form FILE1.PRN; XYZ.LST would be combined with XYZ.REF to form XYZ.PRN; etc. Note that in this case (when multiple files are to be created), only one file from each of the source filespecs is used to create a given target file.

For more information about global characters, refer to “Global File Name Characters” in Chapter 2.

It is easy to enter a COPY command to combine files where one of the source files is the same as the target, yet this often cannot be detected. For example:

```
copy *.lst all.lst
```

This would produce an error unless ALL.LST already exists as the first file with extension .LST or is added to the directory as the first .LST file. The error would not be detected, however, until it was time for ALL.LST to be appended; by this time, ALL.LST could already have been altered.

## COPY Command

COPY handles this situation as follows. As each input file is found, its name is compared with the target file name. If the names are the same, that one input file is skipped, and the following message is displayed on the screen:

### Content of destination lost before copy

Further copying proceeds normally. This allows *summing* files, with a command like:

```
copy all.tmp + *.lst
```

This command appends all .LST files, to ALL.TMP. In this case, the error message is suppressed, because this is a true *physical append* to ALL.TMP.

**Note:** When combining files, COPY considers the copying process to be successful if at least one, but not necessarily all, of the named source files is found. If none of the source files can be found, you receive the message

```
0 file(s) copied
```

# DIR (Directory) Command

---

**Purpose:**

Lists either all the directory entries, or only those for specified files.

**Note:** Directory entries for hidden system files such as IBMBIO.COM and IBMDOS.COM are not listed, even if present.

**Format:**

DIR [*d:*][*path*][*filename*.[*ext*]][/P][/W]

**Type:**

Internal External

\*\*\*

**Remark:**

Specify the parameters:

[*d:*][*path*][*filename*.[*ext*]] to specify the file whose directory you want to list.

/P to pause the display when the screen is full. The following prompt is displayed:

**Strike a key when ready . . .**

Press any key to continue.

/W to display the information in a wide display format. Only the file names and directory names are shown. This parameter is only recommended for 80-column displays.

# DIR (Directory) Command

## Notes:

1. The information provided in the directory listing includes the volume identification and the amount of free space left on the disk. The freespace amount is rounded up to the nearest 1024 bytes. The display line for each file includes its size in decimal bytes and the date and time the file was last written to.

**Note:** If you set the COUNTRY configuration command to a country other than U.S., the date and time format displayed may be different. The examples in this section show the date displayed for the U.S. date and time format.

2. Entries that name other directories are clearly identified with <DIR> in the file size field.
3. You can use the global characters ? and \* in the file name and extension parameters. For more information about the global characters, refer to "Global File name Characters" in Chapter 2.
4. If you do not specify a file name extension, the default is \*.
5. To display the directory entry for a file that does not have an extension, type the file name followed by a period. In this case, the .ext does not default to \*.

## DIR (Directory) Command

6. The DIR command has two format options (the /P and /W parameters may be used with either option):
  - List All Files
  - or
  - List Selected Files
7. In some instances, the speed at which DIR displays entries may be increased by specifying three or more buffers in the BUFFERS= command in the CONFIG.SYS file. Refer to the "BUFFERS Command" section in Chapter 4.

### Examples:

#### Option 1 - List All Files

The following example lists all the directory entries on the default drive.

```
A>dir
```

The directory may look like this:

```
Volume in drive A is MYDISK
Directory of  A:\

FILE1      A           10368      7-20-83   12:13p
FILE3      A           1613      5-27-83   12:14p
9X          31             8-17-82   10:59a
LEVEL2     <DIR>          9-09-82   12:10p
FILE1      2288          9-02-82   12:25p
5 File(s) 141312 bytes free
```

The following example lists all the directory entries for current directory of drive C.

```
A>dir c:
```

The following example lists all the directory entries for the directory path \LEVEL2:

## DIR (Directory) Command

```
A>dir \level2
```

The screen will look like this:

```
Volume in drive A is MYDISK
Directory of  A:\LEVEL2
```

```

      <DIR>      9-09-84   1:30p
..      <DIR>      9-09-84   2:45p
MYPROG  COM      2463      7-30-84   8:55a
      3 File(s)      141312 bytes free
```

Note that all files in directory LEVEL2 have been listed, including the two special entries found in all subdirectories. The entry marked with a single period denotes the directory being listed (LEVEL2), and the double period denotes this directory's parent directory (in this case, the root directory). Thus, if your *current* directory is LEVEL2 and you wish to see the files in its parent directory, you can enter:

```
dir ..
```

### Option 2 - List Selected Files

The following example lists the directory entry of the file named FILE3.A in the current directory of the default drive.

```
dir file3.a
```

the screen may look like this:

```
Volume in drive A is MYDISK
Directory of  A:\
```

```
FILE3      A      1613      5-27-84   12:14p
      1 File(s)      141312 bytes free
```

## DIR (Directory) Command

If you type:

```
dir *.a
```

the screen may look like this:

```
Volume in drive A is MYDISK
Directory of  A:\

FILE1      A      10368      7-20-84  12:13p
FILE3      A      1613      5-27-84  12:14p
          2 File(s) 141312 bytes free
```

If you type:

```
dir file1
```

the screen may look like this.

```
Volume in drive A is MYDISK
Directory of  A:\

FILE1      A      10368      7-20-84  12:13p
FILE1      A      2288      9-02-84  12:25p
          2 File(s) 141312 bytes free
```

To display only the entry for a file that has no extension, enter the file name followed by a period. In this case, the *.ext* does *not* default to \*. For example,

```
dir file1.
```



# FORMAT

## Command

---

### **Purpose:**

Initializes the disk in the designated drive to a recording format acceptable to DOS; analyzes the entire disk for any defective tracks; and prepares the disk to accept DOS files by initializing the directory, File Allocation Table, and system loader.

### **CAUTION**

Please note that formatting destroys all data on the disk. Because of this, you should be very careful before you decide to format any disk, particularly a fixed disk. If you attempt to format your fixed disk, be aware that the entire contents of any previously created DOS partition, including all subdirectories and their contents, are destroyed. Be sure to set up a DOS partition on all fixed disks before formatting a fixed disk. FORMAT does not recognize a fixed disk as being a DOS disk if a DOS partition does not exist on the disk, it moves to the next fixed disk and begins formatting it. If you do not specify a drive letter, the following message is displayed:

Drive letter must be specified

### **Format:**

[d:][path]FORMAT d:[/S][/1][/8][/V][/B][/4]  
[/N:xx][/T:yy]

### **Type:**

Internal External

\*\*\*

# FORMAT

## Command

### Remark:

Specify the parameters:

[*d:*][*path*] before FORMAT to specify the drive specifier and path that contain the FORMAT command file.

*d:* to specify the drive that contains the disk you want to format.

*/S* to copy the operating system files from the DOS diskette in the default drive to the new disk in the following order:

IBMBIO.COM  
IBMDOS.COM  
COMMAND.COM

If the system does not reside on the default drive, and the default drive is non-removable, FORMAT prompts you to put a system diskette in diskette drive A. If the system is not on the default drive and the default drive is removable, FORMAT prompts you to insert a system diskette in the default drive.

*/1* to format a diskette for single-sided use (5.25 inch drives only).

*/8* to format a diskette for 8 sectors per track. FORMAT defaults to 9 or 15 sectors per track if you do not specify */8*. Note that FORMAT always creates 9 or 15 physical sectors on each diskette track, but it instructs DOS to use only 8 sectors per track if you use the */8* parameter (5.25 inch drives only).

*/V* to give the disk a volume label. We strongly recommend that you use the */V* parameter. This uniquely identifies each disk.

The volume label cannot be used in place of file names as input to any of the DOS commands. The volume label is for your use in keeping track of your disks.

## FORMAT Command

**/B** to format a diskette for 8 sectors per track diskette with space allocated for the IBMBIO.COM and IBMDOS.COM system modules. It does not place the system modules or the command processor on the diskette. This parameter is used to create a diskette on which any version of DOS can be placed through that version's SYS command. If the **/B** parameter is not used, only DOS Version 3.30 can be placed on the diskette through the SYS command.

**/4** to format a single-sided or double-sided diskette in a 1.2MB high-capacity drive. This parameter is intended to allow use of single-sided and double-sided diskettes in the high-capacity drives. However, the diskettes formatted with the **/4** parameter specified may not be read reliably or written in a single- or double-sided drive (5.25 inch drives only).

**/N:xx** to specify the number of sectors per track to format.

**/T:yy** to specify the number of tracks to format.

**/N:xx** and **/T:yy** are used when you want to format a diskette to less than the maximum supported capacity of the diskette drive. See "FORMAT Compatibility" in this section for the supported media types.

# FORMAT

## Command

The following table shows which parameters are valid for certain diskette types:

Disk Type	Parameters Allowed
160KB/180KB	/S, /V, /1, /8, /B, /4
320KB/360KB	/S, /V, /1, /8, /B, /4
720KB/1.44MB	/S, /V, /N, /T
1.2MB	/S, /V, /N, /T
fixed disk	/S, /V

### Notes:

1. All new diskettes and fixed disks must be formatted before they can be used by DOS. Refer to Chapter 3 for more information before formatting your fixed disk.
2. A fixed disk must also be formatted again if you change the size of its DOS partition with the FDISK command.
3. Formatting destroys any previously existing data on the disk.
4. During the formatting process, any defective tracks are marked as *reserved* to prevent the tracks from being allocated to a data file.
5. Directory entries for IBMBIO.COM and IBMDOS.COM are marked as *hidden files*, and therefore, they do not appear in any directory searches—including the DIR command.
6. FORMAT prompts you to enter a volume label (volume identification) if you have used the /V parameter. The label can consist of from 1 to 11 characters. All characters acceptable in file names are acceptable in the volume label.

## FORMAT Command

Unlike file names, however, the volume label does not contain a period between the eighth and ninth characters.

You can add or change a volume label using the LABEL command. For more information refer to the LABEL command in this chapter.

7. **FORMAT** produces a status report, that indicates:
  - Total disk space
  - Space marked as defective
  - Space currently allocated to the DOS system files (when /S is used)
  - Amount of space available for your files
8. **FORMAT** determines the target drive type and formats the disk or diskette accordingly. For diskettes, if the diskette can be successfully read and written on only one side, the diskette is formatted for single-sided use, 8 sectors per track; it can be used in either type of drive. If the target drive is double-sided and you do not use the /1 parameter, the diskette is formatted for double-sided use; it will not be usable in a single-sided drive.
9. Fixed disks are already physically formatted (proper recording format) when shipped by IBM. When formatting a fixed disk, **FORMAT** checks all locations within the DOS partition, but does not physically format them again.
10. If the /S parameter is used and the system has insufficient available memory for **FORMAT** to load all three system modules, it will load as many modules as it can, format the target disk, and write the modules that are in memory. It must then read the remaining modules from the source disk so they can be placed on the target disk. If the source diskette has been removed from the drive, an appropriate

# FORMAT

## Command

message will prompt you to reinsert it before FORMAT can continue.

11. The parameters /S and /V cannot be specified with the /B parameter.
12. If you specify the /S parameter, the system files are copied from the default drive. If the default drive is a fixed disk drive that does not contain the system files, then you are prompted to insert the DOS diskette in drive A.
13. If you specify the /N or /T, then both parameters must be entered, or FORMAT returns the following message **Invalid parameter** .
14. The parameters /N and /T should not be used on a fixed disk. The message **Parameters not compatible with fixed disk** will be returned.
15. FORMAT allows you to specify /V or /S with the /N and /T parameters.
16. To create a single – sided diskette, you can use the /T /N on machines that support this function or on machines that do not. An **Invalid parameter** is returned. The /1 can be used with /T /N if the target drive is a high capacity drive, and /T /N specifies a 320KB/360KB diskette. For example, (/T:40 /N:9 or /T:40 /N:8). To format a 720KB diskette in a 1.44MB drive, use /N:9 /T:80.
17. FORMAT ignores any drive reassignments (see the ASSIGN command in this chapter.)
18. The FORMAT command sets the exit code as follows:
  - 0 Successful completion of most recent format
  - 1 Not defined

# FORMAT Command

- 2 Not defined
- 3 Terminated by user (Ctrl-Break)
- 4 Terminated due to error
- 5 Terminated due to "N" response on a fixed disk.

These codes can be used with the batch processing IF  
ERRORLEVEL subcommand.

- 19. FORMAT should not be used with drives involved in a  
JOIN or substitution (SUBST).
- 20. FORMAT does not work on network drives.

# FORMAT

## Command

### FORMAT Compatibility

The following table shows the possible diskette combinations that may be used with FORMAT:

Drive Type	Diskette Type
160KB/180KB	160KB/180KB single-sided diskettes
320KB/360KB	320KB/360KB single-sided or double-sided diskettes
720KB	720KB double-sided diskettes
1.44MB	720KB double-sided diskettes or 1.44MB double-sided diskettes
1.2MB	160KB/180KB single-sided*, 320KB/360KB double-sided* or high-capacity diskettes

\* To format a single-sided or double-sided diskette in a high-capacity drive, use the /4 parameter referred to in this chapter.

No other combinations are allowed.

### Parameter Compatibility

FORMAT supports setting up diskettes for previous versions of DOS. To avoid situations where the diskette may be incompatible with version 1.10 some parameters are incompatible. Because /B and /8 produce 8 sector diskettes (presumably to run on DOS 1.10) /V cannot be specified because DOS 1.10 does not support volume labels. If the /S option also is specified, FORMAT assumes that only the current version of DOS will be used, so /8 is allowed. Because /B leaves room for system files but does not copy them /S is contradictory when used with /B. /B /V /8, is not allowed, /8 /V /S is allowed.



# FORMAT Command

## Examples:

By issuing the following command, the diskette in drive B is formatted and the operating system files are also copied:

```
A>format b:/s/v
```

The system displays the following message:

```
Insert new diskette for drive B:
and strike ENTER when ready
```

After you insert the appropriate diskette and press ENTER, the system displays this message:

```
Head   h       Cylinder   c
```

while the diskette formatting is taking place.

Once the formatting is complete, the system displays this message:

```
Format complete
System transferred
```

```
Volume label (11 characters, ENTER for none)? mydisk
```

```
xxxxxxx bytes total disk space
  xxxxxx bytes used by system
xxxxxxx bytes available on disk
```

```
Format another (Y/N)?n
```

In the above example, note that MYDISK was typed as the volume label.

Type **y** and press Enter to format another diskette.

Type **n** and press Enter to end the FORMAT program.

## FORMAT Command

When you format a fixed disk, that has previously been formatted using FORMAT you see the following message instead of the prompt to insert a diskette:

```
Enter current Volume Label for Drive
(Press enter for none):
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE x: WILL BE LOST!
Proceed with Format (Y/N)?
```

The *x* is replaced by the drive letter you typed. If you want to format your fixed disk, type *y* and press Enter. If you do not want to format your fixed disk, type *n* and press Enter.

If the Volume label you specified does not match the volume label on the disk, the following message is displayed:

```
Invalid Volume label
```

Fixed disk formatting can take several minutes because of the large size that can be allocated to DOS, so don't be alarmed if it takes some time before you are prompted for the volume label. You can tell that FORMAT is working by noting that your fixed disk drive light is on.

# KEYB (Load Keyboard) Command

---

**Purpose:**

Loads a keyboard program that replaces the keyboard program resident in ROM BIOS to support non-U.S. English keyboards.

**Note:** The keyboard programs provided on previous versions of DOS are not compatible with DOS 3.30 and should not be executed when running under DOS 3.30.

**Format:**

[d:][path]KEYB [xx[,yyy],[[d:][path]filename[.ext]]]

**Type:**

Internal External

\*\*\*

**Remark:**

Specify the parameters:

[d:][path] before KEYB to specify the drive and path that contain the KEYB command file. If no other parameters are specified, KEYB will return the current status of the keyboard and display.

xx to specify the keyboard code (see Appendix B, Country and Keyboard Codes).

yyy to specify the numeric code page defining the character set (see Appendix B, Country and Keyboard Codes). If the yyy parameter is omitted, KEYB will use the country default code page.

[[d:][path]filename] to specify the drive, path, and filename of the keyboard definition file (KEYBOARD.SYS) to support a country language. If this parameter is omitted, KEYB will

## KEYB (Load Keyboard) Command

look for the file KEYBOARD.SYS in the root directory of your current drive.

The first use of this command loads a program into memory that replaces the ROM BIOS keyboard program.

- You can change from the current keyboard to the US keyboard format and back again at any time by holding down the Ctrl and Alt keys and pressing F1. Press Ctrl – Alt – F2 to return to the specified country keyboard format contained in the memory resident keyboard program.
- You can change the country keyboard format without restarting the computer (the KEYB command can be used multiple times).
- The copy of the DOS Start-Up Diskette or DOS Start-Up/Operating Diskette you created with the SELECT command loads KEYB when you start DOS. Refer to Chapter 3 for information on the SELECT command.
- The Country and Keyboard Codes table in Appendix B contains keyboard codes to support a particular country keyboard. See Chapter 9 for the valid keyboard code page pairs.

Non-US keyboards have some keys with "front – face" characters. To use these characters, press and hold the Ctrl and Alt keys, and press the appropriate character key.

**Note:** For users that have the Canadian French keyboard, press and hold the Alt and shift keys, and press the appropriate key.

You can get accented characters with the use of "dead keys," that is, keys that do not produce characters unless they are used in combination with another key. To "build" an accented character, press and release the accent key and then press the

## KEYB (Load Keyboard) Command

appropriate letter key. To use the accent character by itself, press the accent key and then press the spacebar.

See "Allowable Dead Key Combinations," in Appendix D in this book.

### KEYBOARD.SYS

The KEYBOARD.SYS file contains tables which direct the KEYB.COM command to convert scan codes to ASCII characters. To change a keyboard, the new keyboard must support at least one of the currently prepared code pages for the CON device. You can change the keyboard without restarting the computer. (For example, the KEYB command can be used multiple times.)

The MODE command is used to prepare the new code pages required by the new keyboard layout; only certain keyboards or code page combinations are allowed. If a mismatch is created between keyboard and display, character keys may not be correctly translated into the correct code page, and incorrect characters may be displayed.

## KEYB (Load Keyboard) Command

The following table shows the valid combinations of code pages and keyboards:

Code Page	Keyboard
437	US, UK, FR, GR, IT, SP, LA, SV, SU, NL
850	UK, FR, GR, IT, SP, DK, NL, SU, NO, PO, SV, SF, SG, CF, BE, LA, US
860	PO
863	CF
865	NO, DK

The KEYB command creates translation tables for each code page that has been prepared at the time KEYB is issued. It will activate the code page that has been requested. If a code page is desired that is not in that list of prepared code pages, it must be first prepared and then KEYB should be issued again. Refer to the MODE command in this chapter.

If a code page has been selected previous to the KEYB command, and no code page is specified in KEYB, it will attempt to activate the selected code page.

# KEYB (Load Keyboard) Command

The KEYB command sets the following ERRORLEVEL code:

- 0 Successful execution and termination
- 1 Invalid language, code page, or syntax
- 2 Bad or missing keyboard definition file
- 3 KEYB could not create a keyboard table in resident memory
- 4 An error condition occurred when communicating with the CON device
- 5 Code page request has not been prepared
- 6 The translation table for the selected code page cannot be found in the resident keyboard table.

# **LABEL (Volume Label)**

## **Command**

---

### **Purpose:**

Allows you to create, change or delete a volume label on a disk.

### **Format:**

`[d:][path]LABEL [d:][volume label]`

### **Type:**

Internal External

\*\*\*

### **Remark:**

Specify the parameters:

`[d:][path]` before LABEL to specify the drive and path that contains the LABEL command file.

`[d:]` to specify the drive letter of the disk you want to label. If you do not specify a drive letter, the default drive is assumed.

`[volume label]` to specify the volume label. Volume labels are used to identify a disk. They can be up to 11 characters and are in the same format as volume labels created by FORMAT/V. If you do not specify a volume label, you are prompted with the following messages:

```
Volume in drive X is xxxxxxxxxxxx
```

```
Volume label (11 characters, ENTER for none)?
```

To give the disk a volume label, type the label you want and press Enter.

To change an existing volume label, type the new volume label and press Enter. The new label you typed replaces the existing volume label.



## **LABEL (Volume Label) Command**

To delete a volume label, do not specify a volume label; just press Enter. Then you are prompted:

```
Delete current volume label (Y/N)?
```

Type **y** and press Enter. The volume label on the disk is deleted.

If you type more than 11 characters for the volume label, only the first 11 characters are used.

### **Examples:**

#### **Creating a Volume Label**

The following example creates a volume label called ADDRESS on the diskette in drive A.

```
A>label a:address
```

The following example gives the fixed disk C the label FIXEDISKC.

```
A>label c:fixediskc
```

#### **Changing a Disk's Volume Label**

The following example changes the volume label of the diskette in drive A from ADDRESS to PROGRAMS.

```
A>label a:
```

Then you are prompted:

```
Volume in drive A is ADDRESS
```

```
Volume label (11 characters, ENTER for none)?
```

## **LABEL (Volume Label) Command**

Type:

```
programs
```

Then press Enter.

### **Deleting a Volume Label**

The following example deletes the volume label PROGRAMS from the diskette in drive A.

```
A>label a:
```

You are prompted:

```
Volume in drive A is PROGRAMS
```

```
Volume label (11 characters, ENTER for none)?
```

Press Enter. The following prompt is displayed:

```
Delete current volume label (Y/N)?
```

Type **y** and then press Enter. The volume label for drive A is deleted.

**Note:** LABEL should not be used with SUBSTed drives. The *root* directory of the actual drive will be the target of LABEL. LABEL should not be used with ASSIGNED drives or to label network drives.

# MODE Command

---

**Purpose:**

Sets the way that a printer, a Color/Graphics monitor adapter, or an Asynchronous Communications Adapter operates; and it sets up and controls code page switching.

**Format:**

[d:][path]MODE LPT#[:][n],[m],[P]]

or

[d:][path]MODE n

or

[d:][path]MODE [n],m,[T]

or

[d:][path]MODE COM#[:]baud[, [parity]  
[, [databits]/[, [stopbits]/[, P]]]]

or

[d:][path]MODE LPT#[:] = COMn

or

[d:][path]MODE device CODEPAGE PREPARE =  
((cp) [d:][path]filename[.ext])

or

[d:][path]MODE device CODEPAGE PREPARE = ((cplist)  
[d:][path]filename[.ext])

or

# MODE

## Command

[d:][path]MODE *device* CODEPAGE SELECT = *cp*

or

[d:][path]MODE *device* CODEPAGE [/STATUS]

or

[d:][path]MODE *device* CODEPAGE REFRESH

### Type:

Internal External

\*\*\*

### Remark:

#### Note:

- CODEPAGE can be shortened to CP
- PREPARE can be shortened to PREP
- SELECT can be shortened to SEL
- REFRESH can be shortened to REF
- STATUS can be shortened to STA

A missing or invalid *n* or *m* parameter means that the mode of operation for that parameter is not changed.

# MODE Command

## Technical Note:

Option	Parameters
1	P
2	R - L
3	P
4	

When using the following options and parameters listed in the table above, the **MODE** command causes printer and Asynchronous Communications Adapter intercept code and screen parameter table information to be resident in memory. This increases the resident size of DOS in memory. The resident portion is common for all four operations that cause it to be loaded. Once loaded, invoking another option causing residency does not cause any additional code to become resident.

## Notes:

1. **MODE LPT#[:][n][,m]** disables the redirection for the printer designated by the #. Redirection causes a portion of **MODE** to remain resident.
2. Because **LPT#[:]** and **COM[:]** are DOS device names, you can specify them with or without the colon (:). For example, you can specify:

```
mode lpt1: 132,8
```

or

```
mode lpt1 132,8
```

or

```
mode lpt1=com1
```

# MODE

## Command

The MODE command has eight format options:

### Option 1 (For the printer)

MODE LPT# [:][*n*][,*m*] [ ,*P*]

where:

# is 1, 2, or 3 (the printer number)

*n* is 80 or 132 (characters per line)

*m* is 6 or 8 (lines per inch vertical spacing)

*P* specifies continuous retry on time-out errors

For example:

```
mode lpt1:132,8
```

sets the mode of operation of printer number 1 to 132 characters per line and 8 lines per inch vertical spacing. The power-on default options for the printer are 80 characters per line and 6 lines per inch. If the printer is reset or initialized, the default values are set (BASICA initializes the printer).

If you specify an invalid **n** or **m** value, the values are ignored and the previous value is unchanged. The retry loop can be stopped by pressing Ctrl-Break. To stop time-out errors from being continuously retried when you have entered **P**, you must use MODE Option 1 without specifying **P**. You should not request continuous retries for printers being shared on the IBM PC Network.

### Option 2 (For switching Display Adapters, and setting the display mode of the Color/Graphics Monitor Adapter)

MODE *n*

or

MODE [*n*],*m*[,*T*]

where:

## MODE Command

- n* is 40, 80, BW40, BW80, CO40, CO80, or MONO
- 40** sets the display width to 40 characters per line (for Color/Graphics Monitor Adapter).
- 80** sets the display width to 80 characters per line (for Color/Graphics Monitor Adapter).
- BW40** switches the active display adapter to the Color/Graphics Monitor Adapter, and sets the display mode to Black and White (disables color) with 40 characters per line.
- BW80** switches the active display adapter to the Color/Graphics Monitor Adapter, and sets the display mode to Black and White (disables color) with 80 characters per line.
- CO40** switches the active display adapter to the Color/Graphics Monitor Adapter, enables color, and sets the display width to 40 characters per line.
- CO80** switches the active display adapter to the Color/Graphics Monitor Adapter, enables color, and sets the display width to 80 characters per line.
- MONO** switches the active display adapter to the Monochrome Display Adapter (which always has display width of 80 characters per line).
- m* is **R** or **L** (shift display right or left).
- T** requests a test pattern used to align the display.

For readability, you can shift a display connected to a color/graphics monitor adapter 1 character (for 40 columns) or 2 characters (for 80 columns) in either direction. If you specify **T** in the **MODE** command, a prompt asks you if the screen is aligned properly. If you type **Y**, the command ends. If you

# MODE

## Command

type N, the shift is repeated, followed by the same prompt.  
For example,

```
mode 80,r,t
```

sets the mode of operation to 80 characters per line and shifts the display 2 character positions to the right. The test pattern is displayed, allowing the opportunity to further shift the display without having to enter the command again.

**Note:** Shifting the display causes all MODE resident code to be loaded.

### Option 3 (For Asynchronous Communications Adapter)

```
MODE COM#[[:]baud[, [parity][, [databits]  
[, [stopbits][, P]]]]
```

where:

**#** is either 1, 2, 3 or 4 (Asynchronous Communications Adapter number).

**baud** equals 110, 150, 300, 600, 1200, 2400, 4800, 9600 or 19200.

**Note:** Only the first 2 digits of the baud rate are required; subsequent digits are ignored (baud 110 = 11, 19200 = 19).

**parity** is either N (none), O (odd), or E (even)—(default = E).

**databits** is either 7 or 8 (default = 7).

**stopbits** is either 1 or 2 (if baud equals 110, default = 2; if baud does not equal 110, default = 1).

These are the *protocol* parameters. They are used to initialize the Asynchronous Communications Adapter. When you specify the protocol, you must specify at least the baud rate.



## MODE Command

The other parameters can be omitted, with the defaults accepted, by entering only commas. For example,

```
mode com1:12,n,8,1,p
```

sets the mode of operation to 1200 baud rate, no parity, 8 databits, and 1 stopbit. To use the defaults listed in the definitions above, you enter:

```
mode com1:12,,,,p
```

The *parity* defaults to even, the *databits* defaults to seven, and the *stopbits* defaults to one.

The **P** option indicates that the asynchronous adapter is being used for a serial interface printer. If you enter the **P**, time-out errors are continuously retried. You can stop the retry loop by pressing Ctrl-Break. To stop the time-out errors from being continuously retried when you have entered **P**, you must reinitialize the asynchronous adapter without entering the **P**. **P** option causes a portion of **MODE** to remain resident. Continuous retries on printers shared on the IBM PC Network may cause degradation on the performance of foreground tasks.

### Option 4 (To redirect parallel printer output to an Asynchronous Communications Adapter)

```
MODE LPT#[:] = COMn
```

where:

**#** is either 1, 2, or 3 (printer number).

**n** is either 1, 2, 3 or 4 (Asynchronous Communications Adapter number).

All output directed to printer LPT# is redirected to the asynchronous adapter *n*.

# MODE

## Command

**Note:** Before you can use MODE to redirect parallel printer output to a serial device, you must initialize the Asynchronous Communications Adapter by using Option 3. If that serial device is a printer, your serial initialization command should also include the **P** parameter.

### Option 5 (To prepare code pages)

```
MODE device CODEPAGE PREPARE = ((cplist)  
[d:][path]filename.[ext])
```

or

```
MODE device CODEPAGE PREPARE =  
((cp) [d:][path]filename.[ext])
```

where:

- |               |  |
|---------------|--|
| <b>device</b> | specifies one of CON, PRN, LPT1, LPT2, or LPT3.  |
| <b>cp</b>     | specifies one code page number.  |
| <b>cplist</b> | specifies a list of code pages. The code page must be of the following values, 437, 850, 860, 863, or 865. |

If a *cplist* is a list of code pages, the code pages must be enclosed in ( and ).

[*d:*][*path* ]*filename*.[*ext*]  
specifies the file containing the code pages. The code page information files provided on the DOS Start-Up Diskette have the extension of CPI.

- 4201.CPI - IBM Proprinter
- 5202.CPI - IBM Quietwriter III Printer
- EGA.CPI - EGA type devices

## MODE Command

- LCD.CPI - IBM Convertible LCD

If a value is not specified for the code page position, the unspecified code page can then be enclosed by a pair of commas. For example:

```
mode lpt1 cp prep=((850,,863) 4201.cpi)
```

specifies the first code page of 850, the second code page remains the same as was previously prepared for the LPT1, the third code page is specified as 863, and the character shapes for IBM Proprinter Model 4201 is specified.

If one of the code pages in the *cplist* is not defined in the font file, or a wrong file has been used, all code pages that correspond in position to the code pages in the *cplist* will then become undefined.

Care should be used when preparing a code page that is a hardware code page or the prepared code page may replace the hardware code page.

For IBM Quietwriter III Printer Model 5202, when a code page has been defined in the CONFIG.SYS as a hardware code page, the code page does not need to be prepared again.

For example:

```
mode con cp prepare=((850,,437) ega.cpi)
```

or

```
mode lpt1: cp prepare=((850,,437)c:\dos33  
\4201.cpi)
```

or

```
mode lpt3: cp prep=((850 863) 4201.cpi)
```

# MODE

## Command

### Option 6 (To select or activate a code page)

MODE *device* CODEPAGE SELECT = *cp*

where:

**cp** identifies the code page to be activated. Choose one of the following codes—437, 850, 860, 863 or 865. The value of *cp* must be one found in the list prepared by Option 5.

The device named CON or LPT# is set to the specified code page.

**Note:** The specified code page must be one of the code pages in the *cplist* provided by the Option 5 MODE command for the same device.

```
mode lpt3: cp select=850
```

If the code page specified exists as both prepared and hardware code page, it is always the prepared code page that will be selected.

If a IBM Proprinter Model 4201 has a buffer created during start time by specifying a non-zero *n* in the DEVICE command, the images of the prepared code pages are then stored in the buffer. When a code page is selected, and the code page image has never been loaded onto the printer, or the code page image has been replaced by another previously selected code page then the code page image will be loaded onto the printer before the code page is activated.

For the IBM Quietwriter III Printer Model 5202, if after a code page has been selected and the printer sounds a beep, then you have to make sure the font cartridge of the selected code page has been installed, or if the cartridge of the selected code page has the typestyle that is currently being used for printing.

# MODE Command

## Option 7 (To display the currently active code page)

`MODE device CODEPAGE [/STATUS]`

The active code page and a list of selectable code pages for an active device such as CON: or LPT#: is displayed.

The list of code pages is divided into hardware, and the prepared code page sections. Those in the hardware section are the code pages defined as *hwcp* in the DEVICE command. Those in the prepared section are prepared through a MODE command.

## Option 8 (To Refresh a code page)

This command re-establishes the active code page if its been lost. Code pages can be lost in different ways. One way is to turn off the printer. After turning off a printer and then on, a printer may have a different active code page than the active code page maintained by the printer driver. It is then necessary to do a refresh command to get back the original active code page. For example:

```
mode lpt1 cp prep=((860) c:\dos33\4201.cpi)
mode lpt1 cp refresh
```

The code page image for the IBM Proprinter Model 4201 will also be loaded into the printer, if a buffer has been created to hold the code page images.

# NLSFUNC

## Command

---

**Purpose:**

NLSFUNC provides support for extended country information and allows you to use the CHCP command to select code pages for all devices defined as having code page switching support. NLSFUNC must be loaded prior to using the CHCP command. See the DEVICE command in Chapter 4.

**Format:**

`[d:][path]NLSFUNC [[d:][path]filename[.ext]]`

**Type:**

Internal External

\*\*\*

**Remark:**

Specify the parameters:

`[d:][path]` before NLSFUNC to specify the drive specifier and path that contain the NLSFUNC command file.

`[d:][path] filename[.ext]` after NLSFUNC to specify the location and name of the country information file (COUNTRY.SYS). If this parameter is omitted, the drive path and file name defined by the COUNTRY= command in the CONFIG.SYS file are used. The file name must be included if drive or path are specified. For example:

```
nlsfunc c:\dir1\country.sys
```

loads the NLSFUNC command and specifies the location of the COUNTRY.SYS file in a directory called DIR1.

# PATH (Set Search Directory) Command

---

**Purpose:**

Searches specified directories for commands or batch files that were not found by a search of the current directory.

**Format:**

PATH [[d:]path[[:[d:]path]]]

or

PATH ;

**Type:**

Internal External

\*\*\*

**Remark:**

You may specify a list of drives and path names, separated by semicolons (note that path names must be specified and will not default to the current directory). Then, when you enter a command that is not found in the current directory of the drive that was specified (or implied) with the command, DOS searches the named directories in the sequence you entered them. The current directory is not changed.

Typing PATH with no parameters displays the current path. Typing PATH with only a semicolon (PATH ;) resets the search path to null (no extended search path). This is the default when DOS is started. In this case, DOS searches only the current directory for commands and batch files.

# PATH (Set Search Directory) Command

## Notes:

1. Erroneous information in the paths, such as invalid drive specifications or imbedded delimiters, will not be detected until DOS actually needs to search the specified paths.
2. If a path is specified that no longer exists at the time DOS uses it to search for a command or batch file, DOS ignores that path and goes on to the next.
3. PATH only finds files that can be executed; such as .COM, .EXE, and .BAT files. PATH will not find files with any other extensions.
4. A copy of the environment is saved with terminate and stay-resident programs. Invoking programs with a resident portion (MODE, PRINT, GRAPHICS) before a large path is set saves usable memory.
5. Terminate and stay-resident programs are loaded above the environment area so growth of the environment is limited to 128 bytes or the current size, whichever is greater.

## Examples:

For the following examples, assume the program MYPROG.COM is only in directory MYDIR on drive B, and that the default drive is drive A.

The following example instructs DOS to look in the current directory of the specified drive, followed by A:\LEVEL2\LEVEL3, then B:\MYDIR for a command you specify.

```
A>path a:\level2\level3;b:\mydir
```



## PATH (Set Search Directory) Command

If the command typed is *not* found in any of the directories specified in PATH, the following message is displayed:

### Bad command or file name

In the previous example, if you type the command:

```
myprog
```

DOS searches the three specified directories, finding the program MYPROG in B:\MYDIR.

To display the current path, type:

```
path
```

The result is:

```
PATH=A:\LEVEL2\LEVEL3;B:\MYDIR
```

The following example causes DOS to search the current directory of C:, then D:\tools.

```
A>path c.;d:\tools
```

# PRINT

## Command

---

### Purpose:

Prints a queue (list) of data files on the printer while you are doing other tasks on the computer.

### Format:

```
[d:][path]PRINT [/D:device][B:buffsiz]
[/U:busytick] [/M:maxtick][S:timeslice]
[/Q:quesiz][C][T][P][d:][path]
[filename][.ext] . . . ]
```

### Type:

Internal External

\*\*\*

### Remark:

Specify the parameters:

[d:][path] before **PRINT** to specify the drive and path that contains the **PRINT** command file.

/D:device to specify the print device. If not specified, the default device PRN is assumed. /D can only be specified the first time **PRINT** is invoked.

**Important:** If you specify /D, it must be the first parameter.

/B:buffsiz to set the size in bytes of the internal buffer. The default value is 512 bytes. Increasing the value of **B** may enhance the performance of the **PRINT** command. /B can only be specified the first time **PRINT** is invoked.

## PRINT Command

**/U:busytick** to specify the number of clock ticks that PRINT waits until the print device is available. /U is called *busyticks*. The default value for busytick is 1. If PRINT waits longer than /U busyticks, it gives up its time slice. The /U can only be specified the first time PRINT is invoked.

**/M:maxtick** to specify how many clock ticks PRINT can have to print characters on the print device. /M is called *maxticks*. The default value for maxtick is 2 maxticks. The range of values is from 1 to 255 maxticks. This parameter does not need to be specified each time you use PRINT. Specify it only the first time.

**/S:timeslice** to specify the time slice value. The default is 8 time slices. The range of values is 1 to 255. /S can only be specified the first time PRINT is invoked.

**/Q:quesiz** to specify how many print files you can have in the queue. The range of values is from 1 to 32 files. The default value is 10. /Q can only be specified the first time PRINT is invoked.

**/C** to set the cancel mode. Allows you to select which file or files to cancel. The preceding file name and all following file names entered on the command line are canceled from the print queue until a **/P** is found on the command line, or until you press the Enter key.

**/T** to set the terminate mode. All queued files are canceled from the print queue. If a file is currently being printed, the printing stops, a cancelation message is printed, the paper is advanced to the next page, and the printer's alarm sounds.

**/P** to set the print mode. The preceding file name and all following file names are added to the print queue until a **/C** is found on the command line, or until you press the Enter.

The parameters **/D**, **/B**, **/Q**, **/S**, **/U**, and **/M** can only be specified the first time you use PRINT. If you specify them again, the following message is displayed:

# PRINT

## Command

### Invalid parameter

You can enter more than one file name on the command line, each with appropriate parameters. Global file name characters \* and ? are allowed in the file name. Once a file has been queued, you can change the current directory without affecting the printing of the files already in the print queue.

The first time this command is issued, it increases the resident size of DOS in memory.

If no parameters are specified and you press Enter, the files listed on the command line are queued for printing (/P is assumed).

If PRINT is typed with no parameters, PRINT displays the names of the files currently in the print queue.

If you did not specify the device name using /D the first time the PRINT command is executed after you start your system, the following message is displayed on the display screen:

```
Name of list device [PRN]:
```

This allows you to specify the output list device— LPT1, LPT2, LPT3, PRN, COM1, COM2, COM3, COM4, AUX, etc. The default is PRN, and it will be selected if you press Enter.

**Note:** Be sure the device you name is physically attached to your system; naming a nonexistent device will cause unpredictable system behavior.

The files are queued for printing in the order entered. After each file is printed, the printer paper is advanced to the next page. Any tab characters found are expanded with blanks to the next 8 – column boundary.

If PRINT encounters a disk error while attempting to read the file to be printed, PRINT will cause:

- The file currently printing to be canceled

# PRINT Command

- The disk error message to be printed on the printer
- The printer paper to be advanced to the next page and the alarm to be sounded
- The remaining files in the print queue to be printed

If the /T or /C parameters are used to cancel a file or files currently being printed:

- The printer alarm sounds.
- A file cancelation message prints on the printer. If /T, the following message prints:

**All files canceled by operator.**

If /C, the name of the canceled file is printed followed by this message:

**File canceled by operator**

- The printer paper advances to the next page.
- If all files in the print queue have not been canceled, printing resumes with the first file remaining in the print queue.

## Notes:

1. The disk containing the files being printed must remain in the specified drive until all printing is complete. Any file in the print queue must not be altered or erased until after it has been printed.
2. The printer cannot be used for any other purpose while PRINT has data to print. Any attempt to use the printer (Shift – PrtSc, LLIST, Ctrl – PrtSc, LPRINT, etc.) results in an “out – of – paper” indication until all files have been printed or printing is terminated (/T).

## PRINT Command

3. You cannot use PRINT on a network server computer.
4. PRINT expands global file name characters and builds the full path including the drive specifier, for each file to be printed. This string must be less than 63 characters.

### Examples:

In this example, the PRINT command is being used for the first time since the system was started. The command:

```
print a:templ.tst
```

has just been entered, and DOS responds with:

```
Name of list device [PRN]:
```

Press the Enter key to send output to the printer.

## PRINT Command

DOS then sends the file TEMP1.TST from drive A to the print queue and sends the output to the device "PRN" printer. The command:

```
print /t
```

empties the print queue. Any other information on the line is ignored. The command:

```
print temp.* /c
```

removes all TEMP.??? files from the print queue that have the same drive letter as the default drive. The command:

```
print a:temp1.tst/c a:temp2.tst a:temp3.tst
```

removes the three files TEMP1, TEMP2, and TEMP3 on drive A from the print queue. The command:

```
print temp1.tst/c temp2.tst/p temp3.tst
```

removes file TEMP1.TST from the print queue and adds the files TEMP2.TST and TEMP3.TST to the print queue. The command:

```
print temp1.tst temp2.tst temp3.tst/c
```

adds files TEMP1.TST and TEMP2.TST to the print queue, then removes TEMP3.TST from the print queue.

# REPLACE

## Command

---

### Purpose:

Selectively replaces files on the target with files of the same name from the source. Selectively add files from the source to the target.

### Format:

[d:][path]REPLACE [d:] [path]filename [.ext]  
[d:][path] [/A][/P][/R][/S][/W]

### Type:

Internal External

\*\*\*

### Remark:

Specify the parameters.

[d:] [path] before REPLACE specifies the drive and path that contains the REPLACE command file, if it is not in the current directory of the default drive.

[d:] [path]filename [.ext] specifies the names of the files on the source that are to be replaced on the target or added to the target. The file name can contain global file name characters.

[d:][path] specifies the target drive and directory. The files in this directory are the ones that are to be replaced, if /A is specified the source files are copied to this directory. The default is the directory on the current drive.

/A REPLACE copies all files specified by the source that do not exist on the target. This allows you to add files to the target without overwriting the files that already exist on the target. You cannot use /A and /S together.



## REPLACE Command

**/P** REPLACE prompts you as each file is encountered on the target, this allows selective replacing or adding.

**/R** REPLACE replaces files that are read – only on the target.

**/S** REPLACE searches all directories of the target for files matching the source file name. You cannot use **/A** and **/S** together.

**/W** REPLACE is instructed to wait for you to insert a diskette, before beginning to search for source files. If you specified **/W** and did not specify **/A**, the following message is displayed:

Press any key to begin replacing file(s)

If you specified **/W** and **/A** the following message is displayed:

Press any key to begin adding file(s)

If you did not specify **/W** on the command line, then REPLACE begins immediately.

# REPLACE

## Command

### Examples:

Assume you have changed the file “PE.PRO” in your “C:\EDITORS.DIR” subdirectory. To replace all the other copies of “PE.PRO” on your fixed disk (C) enter the following command line:

```
replace c:\editors.dir\pe.pro c:\ /s /p
```

The target path from the root is built, and the global file name characters are expanded. The complete string containing the target drive specifier, the path, and the expanded file name cannot be greater than 63 characters.

Hidden and system files are not found on the source and are not replaced on the target.

REPLACE returns an ERRORLEVEL equivalent to the DOS error code. Some of the most common return codes are listed on the following page. Refer to the “Extended Error Codes” in the “Error

Return Information” section of the *DOS Technical Reference* Chapter 6 for all possible return codes.

## REPLACE Command

Return Code	Error	Explanation
2	File not found	No source file(s) were found.
3	Path not found	The source or target path was invalid or not found.
5	Access denied	The access code for reading or writing a file is not correct for accessing the file. Try again, using /R.
8	Insufficient memory	
11	Invalid format	The command line was not correct due to an invalid parameter, incorrect number of parameters, etc.
15	Invalid drive was specified	
22	Unknown command	Incorrect version of DOS



## Chapter 5. Code Page Switching

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## Introduction

Code page switching is a new feature of DOS 3.30 that changes the characters displayed on a screen or printed on a device. This chapter describes how code page switching works, why it is used, and how it is installed.

To use this feature, you must have one of the following display types:

- Enhanced Graphics Adapter (EGA)
- IBM PC Convertible LCD (LCD)
- IBM Personal System/2 Displays (EGA)

and one of the following printer types:

- IBM Proprinter Model 4201
- IBM Quietwriter III Printer Model 5202

If you reside in the United States or any other country listed in the table on page 9-7, you do not have to use code page switching. If you reside in French-speaking Canada, Denmark, Norway, or Portugal, you must use code page switching.

**Note:** You can use code page switching without fully understanding everything about it. You may go directly to the section entitled “How to Install Code Page Switching” and follow the step-by-step procedure.

## Code Page Definition

Computers store data as numeric values. When you need to display or print information, the computer translates the numeric values into letters, numbers, symbols, and characters you can recognize. The computer uses a table called a code page to accomplish this.

A code page contains the definition of one or more character sets. For example,

```
abcdefghijklmnopqrstuvwxyz  
0123456789  
≈!@#$%^&*( )_+,-./; '[]?{}
```

may be defined as a code page.

A code page may contain up to 16 rows and 16 columns of characters (see Appendix C). The points at which a row and column intersect contain a character. Each DOS code page has 256 characters. Since different languages use different code pages, we need ways to display and switch between the code pages.

For example, in code page 437 (see Appendix C), the point where the column labeled F intersects with the row labeled 2 contains the  $\geq$  character. However, in code page 850 (see Appendix C), this block contains the = character.



## What is Code Page Switching?

DOS 3.30 provides several pairs of code pages which are similar, but they do not contain all of the same characters. For example, the code pages in previous versions of DOS contain the single bar and double bar graphic characters and scientific symbols. In the new multilingual code page (850), most of the scientific symbols and many of the the box graphic characters have been replaced with international characters. Having all of the international characters contained in one code page allows DOS 3.30 to support eleven languages, rather than the five supported by previous versions of DOS.

The new multilingual code page (850) contains all characters for most European and North and South American countries. This code page provides additional characters that may be useful when creating new information.

DOS 3.30 supports the existing code page 437, as well as the following code pages and their corresponding languages:

Code Page	Language
850	Multilingual
860	Portuguese
863	Canadian French
865	Norwegian and Danish

## Why Use Code Page Switching?

If information is entered in a particular code page, it must be viewed in that code page, or some characters may be displayed differently than expected. Since multiple code pages exist, you may need to view existing files created with the existing code page and to view files created with the new 850 code page.

New users should install the new country code pages, because the code pages supplied with DOS 3.30 provide additional national language support for more countries than the previous DOS versions.

If you are now using a previous version of DOS, and code page 437 is your existing code page (see the table on the following page), you should install the new code page so that you can view documents created with the existing code page and access code page characters supplied with DOS 3.30.

If code page 437 is *not* your existing code page (see the table on the following page), you must use the new code page to support your existing code page.

**Warning:** If you encounter problems while using the new code pages with some PC applications, you should terminate the application program and then select the existing code page for your country.

If you want to install code page switching, see the next section in this chapter entitled "How to Install Code Page Switching."

## How to Install Code Page Switching

DOS 3.30 allows for switching among several pairs of code pages. In the step-by-step procedure in this chapter, substitute your system's values from the following table showing the existing country code pages and the new code pages.

Country	Keyboard Code	Existing Code Page	New Code Page
Australia	US	437	850
Belgium	BE	437	850
Canada (Eng.)	US	437	850
Canada (Fr.)	CF	863	850
Denmark	DK	865	850
Finland	SU	437	850
France	FR	437	850
Germany	GR	437	850
Italy	IT	437	850
Latin America	LA	437	850
Netherlands	NL	437	850
Norway	NO	865	850
Portugal	PO	860	850
Spain	SP	437	850
Sweden	SV	437	850
Switzerland (Fr.)	SF	437	850
Switzerland (Ger.)	SG	437	850
United Kingdom	UK	437	850
United States	US	437	850

In order to use code page switching, DOS uses information from font files for the code pages. Each font file contains device information describing the various code pages. In the step-by-step procedure in this chapter, substitute your system's values from the following table.

Device supported	Font files
EGA type displays	EGA.CPI*
IBM Proprinter Model 4201	4201.CPI
IBM Quietwriter III Printer Model 5202	5202.CPI
IBM PC Convertible LCD	LCD.CPI

**\* Code Page Information**

To install code page switching, you must add commands to two files, CONFIG.SYS and AUTOEXEC.BAT. The CONFIG.SYS file contains commands that tell DOS what kinds of devices are attached to your computer. The AUTOEXEC.BAT file contains commands that DOS will perform each time you start it. By modifying these two files, you can tell DOS which devices support code page switching and which code pages should be loaded. By using the MODE and CHCP commands, you can overlay the current code page with another one.

Use the MODE command to change the code pages for displays and printers and the KEYB command to change the code page for the keyboard. The MODE command places new code pages into random access memory (RAM) for the devices and switches between multiple code pages, if that capability in the device is supported.

The command you should add to the CONFIG.SYS file is:

- **DEVICE =**, to describe the display and printer devices that will use code page switching.

Substitute your system's values from the table in Chapter 4 under "DEVICE = commands."

The commands you should add to the AUTOEXEC.BAT file are:

- **NLSFUNC**, to load national language support code.
- **MODE**, to prepare and select code pages specified for devices defined in the CONFIG.SYS file.
- **KEYB**, to load keyboard support for the language you specify.

The following examples show how to install code page switching. You may follow these examples and substitute information for your system.

**Notes:**

1. It is recommended that both files and subdirectories be named using only the characters A-Z and 0-9. This prevents file access problems when switching between code pages and their associated name character capitalization rules.
2. The following examples assume that a CONFIG.SYS file and an AUTOEXEC.BAT file already exist on your system. These two files are created for you when you install DOS 3.30 for the first time.

## Adding DEVICE = statements to the CONFIG.SYS file

1. To add statements to the CONFIG.SYS file, type:

```
copy config.sys+con
```

2. Press Enter.

The following is displayed:

```
config.sys  
con
```

3. To prepare the code page driver for your display, type the following, substituting your system's values for *d:\*, *type*, and *n*.

```
device=d:\display.sys con:=(type,437,n)
```

where:

<i>d:\</i>	specifies the drive and path where the DISPLAY.SYS file is located.
<i>type</i>	specifies the display adapter type. Use LCD for the IBM PC Convertible and EGA for all others.
<i>n</i>	is the number of code pages to be added. If 437 is your existing code page, specify 1. If 437 is not your existing code page, specify 2.

4. Press Enter.

5. To prepare the code page driver for your printer, type the following, substituting your system's values for *d:\*, *type*, and *n*.

```
device=d:\printer.sys lpt1:=(type,437,n)
```

where:

- |             |   |
|-------------|---|
| <i>d:\</i>  | specifies the drive and path where the PRINTER.SYS file is located.   |
| <i>type</i> | specifies the type of printer you have.<br>Use 4201 for the IBM Proprinter Model 4201 or 5202 for the IBM Quietwriter III Printer Model 5202. |
| <i>n</i>    | is the number of code pages to be added.<br>If 437 is your existing code page, specify 1. If 437 is not your existing code page, specify 2.   |

6. Press Enter.

**Note:** Remember each printer requiring code page switching *must* have an LPT*n*: parameter, where *n* is the port position for the printer. You may specify as many as three printers in the same DEVICE = statement.

7. When you have typed in all DEVICE = statements, press the F6 key and the Enter key. The CONFIG.SYS setup procedure is complete.

## Adding commands to the AUTOEXEC.BAT file

1. To add commands to the AUTOEXEC.BAT file, type:

```
copy autoexec.bat+con
```

2. Press Enter.

The following is displayed:

```
autoexec.bat  
con
```

3. Type:

```
nlsfunc
```

4. Press Enter.

5. To prepare the devices defined in the CONFIG.SYS file, type the following, substituting your system's values for *cplist*, *d:\* and *cpfile*.

```
mode con: cp prepare=((cplist) d:\cpfile)
```

where:

*cplist* is 850, if your existing code page is 437. If code page 437 is not your existing code page, *cplist* is 850 plus your existing code page, for example, 850,865.

*d:\* specifies the drive and path where the display code page font file is located.

*cpfile* specifies the name of the code page font file. Use LCD.CPI for the IBM PC Convertible LCD and EGA.CPI for all others.

6. Press Enter.



7. To prepare the printer for code page switching, type the following, substituting your system's values for *cplist*, *d:\* and *cpfile*.

```
mode lpt1: cp prepare=((cplist) d:\cpfile)
```

where:

*cplist* is 850, if your existing code page is 437. If code page 437 is not your existing code page, *cplist* is 850 plus your existing code page, for example, 850,865.

*d:\* Specifies the drive and path where the printer code page font file is located.

*cpfile* specifies the name of the code page font file. Use 4201.CPI for the IBM Proprinter Model 4201 or 5202.CPI for the IBM Quietwriter III Printer Model 5202.

8. Press Enter.

9. To prepare the keyboard for code page switching, type:

```
keyb xx, ,d:\keyboard.sys
```

where:

*xx* specifies your keyboard code. (See the table on page 9-7.)

*d:\* specifies the drive and the path where the KEYBOARD.SYS file is located.

10. Press Enter.

11. To select (activate) the code page that you prepared for your display and printer, type:

```
chcp nnn
```

where *nnn* is your existing code page.

If you are new to DOS, use 850.

12. Press Enter.
13. After you have added all the commands to the AUTOEXEC.BAT file, press the F6 key and the Enter key. The AUTOEXEC.BAT setup procedure is complete.
14. Restart your system to install the code page drivers.

## Appendix A. Messages

**Active code page:** xxx

**Explanation:** CHCP. This is the code page that DOS is currently using. It may not be the same code page currently being used by some attached devices.

**Action:** None.

### **Active code page for device *ddd* is *nnn***

**Explanation:** MODE.

Where:

*ddd* = device name

*nnn* = numeric id of the active code page

In response to a MODE command code page status request, the indicated device has been activated to use the indicated code page.

**Action:** None required. If the desired code page is not the active one, the MODE SELECT function can be used to change the specification, provided the new code page has been defined for the device by an appropriate MODE PREPARE command.

### **Active code page not available from CON device**

**Explanation:** KEYB. The KEYB status function was requested, but the loaded CON code page could not be determined. This is an information message only. Either the code page switching CON driver has not been installed, or there is no currently loaded CON code page.

**Action:** None.

### **Bad or missing Keyboard Definition File**

**Explanation:** KEYB. The KEYBOARD.SYS file could not be found, or it contained invalid data.

**Action:** Ensure that the specified KEYBOARD.SYS file exists. If the file exists, then it has most likely been corrupted. In this case, you should obtain a new KEYBOARD.SYS file from the original DOS Start-Up Diskette or the original DOS Start-Up/Operating Diskette.

### **Code page not prepared**

**Explanation:** MODE. MODE failed during a SELECT operations for one of the following reasons:

- the indicated code page had never been defined to the device.
- the prepared code page does not have the correct font to support the current video mode.

**Action:** Use MODE PREPARE to pass the code page definition to the device, then reissue the MODE SELECT operation to the device. If the error still occurs, increase the number of subfonts (m) in the DEVICE=DISPLAY command in CONFIG.SYS, and restart DOS.

### **Code page xxx not prepared for all devices**

**Explanation:** CHCP. CHCP was unable to select the code page for one of the following reasons:

- a device was not prepared for the requested code page
- a device I/O error occurred
- the device is currently printing
- the device does not support code page switching.

**Action:** Use the MODE command to prepare all devices for code page switching. Refer to “How to Install Code Page Switching” in Chapter 9. Ensure the printer is on-line and not currently printing. Retry the CHCP command.

### **Code pages xxx not prepared for system**

**Explanation:** CHCP. CHCP was unable to select the specified code page. CHCP cannot select a code page if NLSFUNC has not been loaded; or if the code page is not valid for your country; or if no devices have been prepared with the MODE command.

**Action:** Ensure that NLSFUNC is loaded and all devices have been prepared for the code page using the MODE command. Refer to “How to Install Code Page Switching” in Chapter 9. Retry the command.

### **Code page operation not supported on this device**

**Explanation:** MODE. In an attempt to use MODE to PREPARE or SELECT a code page for a device, the specified “device” may have been a file name (not really a device), or it is not a device that supports code pages. The CONFIG.SYS file may not contain the DEVICE=device name command to properly load the device. If the definition on the device is incorrect, the device cannot be properly initialized.

**Action:** Verify the specification of the device for spelling errors. The specified “device” cannot be a file name. Change the CONFIG.SYS file, restart, and try the MODE command again.

### **Code page requested yyy is not valid for given keyboard code**

**Explanation:** KEYB. KEYB attempted to activate a keyboard code page that is not valid for that keyboard. yyy will display the requested code page.

**Action:** Using the MODE command, change the selected code page to one that is valid for the new keyboard, or specify a code page parameter in the KEYB command.

### **Code page specified has not been designated**

**Explanation:** The code page specified on the KEYB command has not been prepared for the CON device. This message is displayed only if the code page switching CON device has been installed.

**Action:** Use the MODE command to prepare the desired code page.

### **Code page specified has not been prepared**

**Explanation:** KEYB. You have a CON device driver loaded that supports code page switching. The code page specified has not been prepared for CON.

**Action:** Use the MODE command to prepare CON with the desired code page.

### **Code page specified is inconsistent with invoked code page**

**Explanation:** The code page specified on the KEYB command has been prepared for the CON device, but is not the currently invoked CON code page. The code page specified becomes the active keyboard code page. It is important to note that the CON code page will not be changed. This means that your CON and keyboard are operating in different code pages.

**Action:** This is a warning message only. The keyboard will be loaded with the code page you requested. You should use the MODE command to change the invoked CON code page to match your keyboard code page. The characters you typed may be displayed incorrectly if your keyboard and CON are operating in different code pages.

### **Code page specified is inconsistent with selected code page**

**Explanation:** KEYB. The code page specified has been prepared for the CON device but is NOT the current CON code page. The specified code page is now the active keyboard code page. It is important to note that the selected CON code page is not changed. This means that your display and keyboard are operating in different code pages. The characters you type may be displayed incorrectly while your display and keyboard are operating in different code pages.

**Action:** Use the MODE command to change the selected code page for the display.

### **Code page xxx**

**Explanation:** MODE. In response to the MODE status request, the device is identified as having both a set of hardware and prepared code pages, as listed by a series of these messages immediately following the message, **hardware code pages:** or **prepared code pages:**.

**Action:** No action. Information only. If desired, use the MODE PREPARE command to pass the code page definitions to the device.

### **Code pages cannot be prepared**

**Explanation:** MODE. Either there are code pages duplicated on the device, or there are more code pages specified than the total number of code pages allowed for the device (PRN, LPT, or CON). For the IBM Quietwriter III Printer Model 5202 device, the code page cannot be a duplicate of the hardware code page (*hwcp*) specified by the DEVICE command in the CONFIG.SYS file.

**Action:** Respecify the MODE command. Check the number of code pages allowed by displaying the list of code pages using the MODE/STATUS command.



### **Current keyboard does not support this code page**

**Explanation:** MODE. While attempting to perform a MODE PREPARE code page function, the device has detected a discrepancy between the currently defined keyboard code and the specified code page.

**Action:** Adjust the KEYB specification to reference the desired code page definitions and reissue the MODE PREPARE code page function.

### **Device error during Status**

### **Device error during Prepare**

### **Device error during Select**

### **Device error during write of font file to device**

**Explanation:** MODE. During the indicated operation of the MODE code page function, the device returned a device error. The device may not support code page functions; or it is not defined to contain sufficient code pages to meet the request; or the device detected certain types of invalidities within the font file contents. The CONFIG.SYS file may not contain the DEVICE=device name command to properly load the device.

**Action:** Verify that the proper device name was specified. Change the CONFIG.SYS file, restart, and try the MODE command again.

### Device or code page missing from font file

**Explanation:** MODE. After transmitting the specified font file to the device handler during a PREPARE operation, DOS responded with an error indicating that the font file does not contain a definition of the indicated code page for the specified device. For the IBM Quietwriter III Printer Model 5202, a hardware code page (*hwcp*) may also generate this error, if the *hwcp* is not defined in the font file.

**Action:** Respecify the MODE command indicating a different code page that is supported by the device. Check the description of the various font files to verify the device and code page combinations supported. For the IBM Quietwriter III Printer Model 5202, if the *hwcp* value is creating the error, then correct the DEVICE command in the CONFIG.SYS file for the printer, and restart DOS.

**Note:** The error causes the existing code pages to be undefined. All specified code pages need to be prepared again. See the MODE command in Chapter 7.

### Device *ddd* not prepared

**Explanation:** MODE.

Where:

*ddd* = device name

In response to a MODE code page status request, the indicated device has not received any code page definitions via a MODE PREPARE command. This operation is required before performing the MODE SELECT operation.

**Action:** No action required. Information only. If desired, use the MODE PREPARE command to pass the code page definitions to the device.

### **Failure to access Code page Font File**

**Explanation:** MODE. During a PREPARE, the attempt to access the indicated code page font file failed.

**Action:** Verify the spelling of the font file name. Verify the presence of the specified font file. Reissue the MODE command with the proper specification of the font file name.

### **Failure to access COUNTRY.SYS**

**Explanation:** SELECT. The attempt to open the COUNTRY.SYS file failed while trying to verify the three-digit country code. The SELECT operation is aborted.

**Action:** Be sure the source diskette (as identified by the first parameter) has a copy of the COUNTRY.SYS file. With the proper diskette in place, repeat the SELECT operation.

### **Failure to access device: xxx**

**Explanation:** During a CODE PAGE operation, the opening of the specified DEVICE failed.

**Action:** Verify the spelling of the DEVICE name and reissue the MODE command with the proper spelling. If that fails to correct the situation, then be sure the specified DEVICE has been loaded by the CONFIG.SYS DEVICE = command, or that the DEVICE is a standard device always present. If the CONFIG.SYS is incorrectly specified, edit that file to the proper specification and restart before retrying the MODE command.

## **Failure to access KEYBOARD.SYS**

**Explanation:** SELECT. The attempt to open the KEYBOARD.SYS file failed while trying to verify the two-character keyboard code. The SELECT operation is aborted.

**Action:** Be sure the source diskette (as identified by the first parameter) contains a copy of the KEYBOARD.SYS file. With the proper diskette in place, repeat the SELECT operation. If this file is inaccessible, then SELECT cannot function, and the KEYB.COM utility will fail, thus allowing the keyboard to be used only in US mode.

### **Hardware code pages:**

#### **Prepared code pages:**

**Explanation:** MODE. In response to the MODE status request, the device is identified as having both a set of hardware and prepared code pages, as listed following this message.

**Action:** No action. Information only. If desired, use the MODE PREPARE command to pass the code page definitions to the device.

#### **Invalid code page specified**

**Explanation:** KEYB. The code page specified on the command line may not be used with the requested language.

**Action:** Correct and retry the operation.

#### **Invalid country code or code page**

**Explanation:** COUNTRY. The country code or code page specified in the COUNTRY = command in the CONFIG.SYS file is invalid or the requested code page is not available for the specified country code.

**Action:** See Appendix B for the correct country code and code page.

### **Invalid language specified**

**Explanation:** KEYB. The language code specified on the command line is not valid.

**Action:** Correct and retry the operation.

### **Invalid signature in COUNTRY.SYS file**

**Explanation:** SELECT. When trying to access the COUNTRY.SYS file in order to verify the 3-character country code, the file named COUNTRY.SYS did not contain the proper header. If the specified country code is not verified, then the SELECT operation will abort. The COUNTRY.SYS file may have been altered prior to execution of SELECT, or some other file may have been accidentally copied over the original COUNTRY.SYS file.

**Action:** Use the original DOS Start-Up Diskette or DOS Start-Up/Operating Diskette and repeat SELECT. If this file is inaccessible, then SELECT cannot function, and the KEYB.COM utility will fail, allowing the keyboard to be used only in US mode.

### **Invalid signature in KEYBOARD.SYS file**

**Explanation:** SELECT. When trying to access the KEYBOARD.SYS file in order to verify the 2-character keyboard code, the file named KEYBOARD.SYS did not contain the proper header. If the specified keyboard code is not verified, then the SELECT operation aborts. The KEYBOARD.SYS file may have been altered prior to execution of SELECT, or some other file may have been accidentally copied over the original KEYBOARD.SYS file.

**Action:** Use the original DOS Start-Up Diskette or DOS Start-Up/Operating Diskette and repeat SELECT. If this file is inaccessible, then SELECT cannot function, and the KEYB.COM utility will fail, allowing the keyboard to be used only in US mode.

### **Invalid syntax on DISPLAY.SYS code page driver**

**Explanation:** DISPLAY.SYS. The syntax of the DEVICE=DISPLAY.SYS command in the CONFIG.SYS file is incorrect.

**Action:** Assure that the parameters are correct, edit the CONFIG.SYS file and restart DOS.

### **Invalid syntax on PRINTER.SYS code page driver**

**Explanation:** PRINTER.SYS. The syntax of the DEVICE=PRINTER.SYS command in the CONFIG.SYS file is incorrect.

**Action:** Assure that the parameters are correct, edit the CONFIG.SYS file, and restart DOS.

### **Invalid syntax on PRINTER.SYS code page switching device drivers**

**Explanation:** MODE. The parameters of the DEVICE command on the PRINTER.SYS are invalid in the CONFIG.SYS file.

**Action:** Correct the parameters of the DEVICE command, and try again.

### **KEYB has not been installed**

**Explanation:** KEYB. The KEYB query function was requested before installing KEYB.

**Action:** Install KEYB. Refer to Chapter 7 for the KEYB command.

### **Missing from the file is either the device ID or the code page**

**Explanation:** MODE. The code page specified in the *cplist* is not supported in the .CPI file, or the .CPI file does not support the type of printer attached to the LPT#. For the IBM Quietwriter III Printer Model 5202, a hardware code page (*hwcp*) in the DEVICE command can generate this error message, if the value of *hwcp* is not defined in the font file. The failure of preparing code pages can cause the existing code pages that are to be replaced by the code pages in the *cplist* to be undefined. There may exist a *cplist* code page duplication, and the code page preparation may not be accepted.

**Action:** Enter the correct code page for the *cplist*, or match the correct .CPI file for the printer type attached to the LPT#; or the code pages need to be prepared again.

### **MODE fff Code page function completed**

**Explanation:** MODE.  
Where:

*fff* = one of the following:

Query, Prepare, Select

The final message from MODE indicating the end of its action regarding the indicated function.

**Action:** No action. Information only.

#### **No code page has been Selected**

**Explanation:** In the MODE STATUS code page operation, the device reports that no code page is selected for that device.

**Action:** No action required. If desired, use MODE to SELECT a code page from the list of prepared code pages that immediately follow this message.

#### **One or more CON code pages invalid for given language**

**Explanation:** KEYB. The KEYB command creates translation tables for each code page prepared at the time KEYB is issued. If any of the code pages are invalid for the given language, the translation table will not be created.

**Action:** Warning message only. The keyboard will be loaded, but only the valid code pages are available for the keyboard.

#### **Previously prepared code page replaced**

**Explanation:** PREPARE. Because the space reserved for a new font definition is already filled, a previously defined code page is replaced by the new specified code page. This is not necessarily an error, since the replacement may have been intentional.

**Action:** Use the MODE code page status function to obtain the current list of code pages currently defined for the device. Use another PREPARE function of MODE to alter the list if not correctly defined.



### **Unable to create KEYB table in resident memory**

**Explanation:** KEYB. The KEYB command was previously installed and allocated a specific amount of resident memory for the tables. The requested configuration exceeds that resident memory.

**Action:** Restart DOS and reinstall KEYB with a new configuration.

### **xxxxxxx code page driver cannot be initialized**

**Explanation:** PRINTER.SYS or DISPLAY.SYS. Incorrect parameters specified in DEVICE = command in CONFIG.SYS.

**Action:** Assure that the device or devices specified and other parameters are correct, edit the CONFIG.SYS file, and restart DOS.

### **nnn version of Graphic Character Set Table is already loaded**

**Explanation:**GRAFTABL.

Where:

nnn = 437

nnn = 860

nnn = 865

nnn = 863

Status message indicating that GRAFTABL was previously used to load a code character table, and that table is still recognized as the specified table. If a new table is loaded by GRAFTABL, it overlays the standard table already in place with no further loss of user RAM space.

**Action:** None.

## **nnn version of Graphic Character Set Table is now loaded**

**Explanation:** GRAFTABL.

**Where:**

nnn = 437

nnn = 860

nnn = 865

nnn = 863

Status message indicating that loading of a character definition table was requested. The operand was the number of the code page to be loaded and the interrupt 1FH was changed to point to the location of the table.

If the status message preceding this message indicated that there was no code page table previously loaded, then the size of available user RAM space has been reduced by the size of this loaded table, plus the size of the interrupt handler.

If the status message preceding this message indicated that there was a code page table previously loaded, then the size of available user RAM space has not been changed. The new table is installed over the table previously loaded.

**Action:** None.

## Appendix B. Country and Keyboard Codes

Country	Country Code	Keyboard Code
United States	001	US
United Kingdom	044	UK
Switzerland (Ger.)	049	SO
Switzerland (Fr.)	041	SE
Sweden	046	SV
Spain	034	SP
Portugal	351	PO
Norway	047	NO
Netherlands	031	NL
Latin America	009	LA
Italy	039	IT
Hawaii	973	
Germany	049	GR
France	033	FR
Finland	358	FU
Denmark	045	DK
Canada (Fr.)	003	CF
Canada (Eng.)	001	US
Belgium	032	BE
Australia	061	US
Arabic	783	

## Country and Keyboard Codes

Select the country and keyboard codes for the SELECT command from the following table.

Country	Country Code	Keyboard Code
Arabic	785	
Australia	061	US
Belgium	032	BE
Canada (Eng.)	001	US
Canada (Fr.)	002	CF
Denmark	045	DK
Finland	358	SU
France	033	FR
Germany	049	GR
Hebrew	972	
Italy	039	IT
Latin America	003	LA
Netherlands	031	NL
Norway	047	NO
Portugal	351	PO
Spain	034	SP
Sweden	046	SV
Switzerland (Fr.)	041	SF
Switzerland (Ger.)	041	SG
United Kingdom	044	UK
United States	001	US

## Appendix C. Code page Tables

Code page 437 (United States) .....	C-3
Code page 850 (Multilingual) .....	C-4
Code page 860 (Portugal) .....	C-5
Code page 863 (Canada-French) .....	C-6
Code page 865 (Norway) .....	C-7

## Appendix C

- (1) ...
- (2) ...
- (3) ...
- (4) ...
- (5) ...

Hex Digits 1st 2nd	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		►		0	@	P	`	p	Ç	É	á	▤	└	≡	α	≡
-1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▥	┘	≡	β	±
-2	☹	↕	"	2	B	R	b	r	é	Æ	ó	▧	┘	≡	Γ	≥
-3	♥	!!	#	3	C	S	c	s	â	ô	ú		┘	≡	π	≤
-4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	┘	—	≡	Σ	f
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	≡	┘	≡	σ	J
-6	♠	—	&	6	F	V	f	v	å	û	ª	≡	≡	≡	μ	÷
-7	•	↕	'	7	G	W	g	w	ç	ù	º	≡	≡	≡	τ	≈
-8	■	↑	(	8	H	X	h	x	ê	ÿ	¿	≡	≡	≡	Φ	°
-9	○	↓	)	9	I	Y	i	y	ë	Ö	┐	≡	≡	≡	Θ	•
-A	◉	→	*	:	J	Z	j	z	è	Ü	┐	≡	≡	≡	Ω	•
-B	♂	←	+	;	K	[	k	{	ï	ø	½	≡	≡	■	δ	✓
-C	♀	└	,	<	L	\	l		î	£	¼	≡	≡	■	∞	n
-D	♪	↔	-	=	M	]	m	}	ì	¥	¡	≡	≡	■	φ	²
-E	🎵	▲	.	>	N	^	n	~	Ä	Pt	«	≡	≡	■	ε	■
-F	☀	▼	/	?	O	_	o	△	Å	f	»	┐	≡	■	∩	

Hex Digits 1st → 2nd ↓	0-	1-	2-	3-	4-	5-	6-	7-		8-	9-	A-	B-	C-	D-	E-	F-
-0		►		0	@	P	`	p		Ç	É	á	▤	└	ø	Ó	-
-1	☺	◄	!	1	A	Q	a	q		ü	æ	í	▥	┌	Ð	β	±
-2	☹	↕	"	2	B	R	b	r		é	Æ	ó	▧	┐	Ê	Ô	=
-3	♥	!!	#	3	C	S	c	s		â	ô	ú	▨	└	Ë	Ò	¼
-4	♦	¶	\$	4	D	T	d	t		ä	ö	ñ	└	—	È	õ	¶
-5	♣	§	%	5	E	U	e	u		à	ò	Ñ	Á	+	ı	Õ	§
-6	♠	—	&	6	F	V	f	v		â	û	ª	Â	ã	í	μ	÷
-7	•	↕	'	7	G	W	g	w		ç	ù	º	À	Ã	î	þ	˘
-8	◼	↑	(	8	H	X	h	x		ê	ÿ	¿	©	└	Ï	Þ	°
-9	○	↓	)	9	I	Y	i	y		ë	Ö	®	≡	└	└	Ú	¨
-A	◉	→	*	:	J	Z	j	z		è	Ü	¬	≡	└	└	Û	•
-B	♂	←	+	;	K	[	k	{		ï	ø	½	≡	└	▀	Ù	¹
-C	♀	└	,	<	L	\	l			î	£	¼	≡	└	▀	Ý	³
-D	♪	↔	-	=	M	]	m	}		ì	Ø	¡	¢	≡	└	Ý	²
-E	🎵	▲	.	>	N	^	n	~		Ä	×	«	¥	≡	└	·	■
-F	☀	▼	/	?	O	_	o	△		Å	f	»	└	□	▀	,	



Hex Digits		0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
1st 2nd	→ ↓																
-0			►		0	@	P	`	p	Ç	É	á	▤	└	≡	α	≡
-1	☺	◄	!	1	A	Q	a	q	ü	À	í	▥	┐	≡	β	±	
-2	☺	↕	"	2	B	R	b	r	é	È	ó	▧	└	≡	Γ	≥	
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	▨	┐	≡	π	≤	
-4	♦	¶	\$	4	D	T	d	t	ã	õ	ñ	└	—	≡	Σ	ƒ	
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	≡	└	≡	σ	J	
-6	♠	—	&	6	F	V	f	v	Á	Ú	ª	≡	≡	≡	μ	÷	
-7	•	↕	'	7	G	W	g	w	ç	ù	º	≡	≡	≡	τ	≈	
-8	■	↑	(	8	H	X	h	x	ê	î	¿	≡	≡	≡	Φ	°	
-9	○	↓	)	9	I	Y	i	y	Ê	Ï	Ò	≡	≡	≡	Θ	•	
-A	⊙	→	*	:	J	Z	j	z	è	Ü	¬	≡	≡	≡	Ω	•	
-B	♂	←	+	;	K	[	k	{	ï	ø	½	≡	≡	≡	■	δ	✓
-C	♀	└	,	<	L	\	l		Ô	£	¼	≡	≡	≡	■	∞	ⁿ
-D	♪	↔	-	=	M	]	m	}	ì	Ù	ì	≡	≡	≡	■	ø	²
-E	🎵	▲	.	>	N	^	n	~	Ã	Pt	«	≡	≡	≡	■	ε	■
-F	☀	▼	/	?	O	_	o	△	Â	Ó	»	└	≡	≡	■	∩	

Hex Digits 1st → 2nd ↓	0-	1-	2-	3-	4-	5-	6-	7-		8-	9-	A-	B-	C-	D-	E-	F-
-0		►		0	@	P	`	p		Ç	É		▤	┐	≡	α	≡
-1	☺	◄	!	1	A	Q	a	q		ü	È	'	▥	└	≡	β	±
-2	☹	↕	"	2	B	R	b	r		é	Ê	ó	▧	└	≡	Γ	≥
-3	♥	!!	#	3	C	S	c	s		â	ô	ú	▨	└	≡	π	≤
-4	♦	¶	\$	4	D	T	d	t		Â	Ë	¨	└	—	≡	Σ	ƒ
-5	♣	§	%	5	E	U	e	u		à	Ï	˘	≡	+	≡	σ	J
-6	♠	—	&	6	F	V	f	v		¶	û	³	≡	≡	≡	μ	÷
-7	•	↕	'	7	G	W	g	w		ç	ú	˙	≡	≡	≡	τ	≈
-8	■	↑	(	8	H	X	h	x		ê	œ	î	≡	≡	≡	Φ	°
-9	○	↓	)	9	I	Y	i	y		ë	Ô	ˆ	≡	≡	└	Θ	•
-A	◉	→	*	:	J	Z	j	z		è	Ü	˘	≡	≡	└	Ω	•
-B	♂	←	+	;	K	[	k	{		ï	ø	½	≡	≡	■	δ	√
-C	♀	└	,	<	L	\	l			î	£	¼	≡	≡	■	∞	ⁿ
-D	♪	↔	-	=	M	]	m	}		=	Û	¾	≡	≡	■	φ	²
-E	🎵	▲	.	>	N	^	n	~		À	Û	«	≡	≡	■	ε	■
-F	☀	▼	/	?	O	_	o	△		§	f	»	└	≡	■	∩	

Hex Digits		0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
1st 2nd	→ ↓																
-0			►		0	@	P	`	p	Ç	É	á	▤	┐	≡	α	≡
-1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▥	└	≡	β	±	
-2	☹	↕	"	2	B	R	b	r	é	Æ	ó	▧	└	≡	Γ	≥	
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	▨	└	≡	π	≤	
-4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	▩	└	≡	Σ	ƒ	
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	▪	└	≡	σ	J	
-6	♠	—	&	6	F	V	f	v	â	û	ª	▫	└	≡	μ	÷	
-7	•	↕	'	7	G	W	g	w	ç	ú	º	▬	└	≡	τ	≈	
-8	■	↑	(	8	H	X	h	x	ê	ÿ	¿	▮	└	≡	Φ	◦	
-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌋	▯	└	≡	⊖	•	
-A	◉	→	*	:	J	Z	j	z	è	Ü	⌋	▯	└	≡	Ω	•	
-B	♂	←	+	;	K	[	k	{	ï	ø	½	▰	└	≡	■	δ	√
-C	♀	└	,	<	L	\	l		î	£	¼	▱	└	≡	▬	∞	ⁿ
-D	🎵	↔	-	=	M	]	m	}	ì	Ø	ì	▱	└	≡	▬	∅	²
-E	🎵	▲	.	>	N	^	n	~	Ä	Pt	«	▱	└	≡	▬	ε	■
-F	☼	▼	/	?	O	_	o	△	Å	f	⌋	▱	└	≡	▬	∩	



## Appendix D. Allowable Dead Key Combinations

Germany:  
áéÉíóú àèìòù

France:  
ăĂëïöŒüŸÿ âêîôû

Spain:  
ăĂëïöŒüŸÿ áéÉíóú  
àèìòù âêîôû

UK:  
dead key not supported

Italy:  
dead key not supported

Belgium:  
âëüïô âëüïöÿĂŮŒ áéúíóÉ àèùìò ñÑ

Denmark:  
éÉáíóú àèìòù âêîôû ăĂëïöŒüŸÿ

Norway:  
éÉáíóú àèìòù âêîôû ăĂëïöŒüŸÿ

Portugal:  
áÁéÉííóóúú ŃĂõŎñÑüŮ àÀèÈììòòùŮ âÂêÊôô

Swiss French:  
ñÑ âêîôû àèìòù äëïöŮĂËÏŮŸÿ éÉáíóú

Swiss German:  
ñÑ âêîôû àèìòù äëïöŮĂËÏŮŸÿ éÉáíóú

Sweden:  
éÉáíóú àèìòù âêîôû ăĂëïöŒüŸÿ ñÑ

Finland:  
éÉáíóú àèìòù âêîôû ăĂëïöŒüŸÿ ñÑ

Canada:  
éÉíí àÀèÈùŮ âÂêÊííóóúŮ ăĂëÈííöŮŮŮ çÇ

# THE HISTORY OF THE CITY OF NEW YORK

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## Introduction

Templates are used to locate character positions on the keyboard. Different characters can appear in different positions, depending on the country language selected with the KEYB command.

From the table of contents on the previous page, select the country language you want to use. Use the templates to select the keys that you want. Function keys located across the top of the keyboard are not shown. Shaded areas indicate keys are not available on some U.S. keyboards.

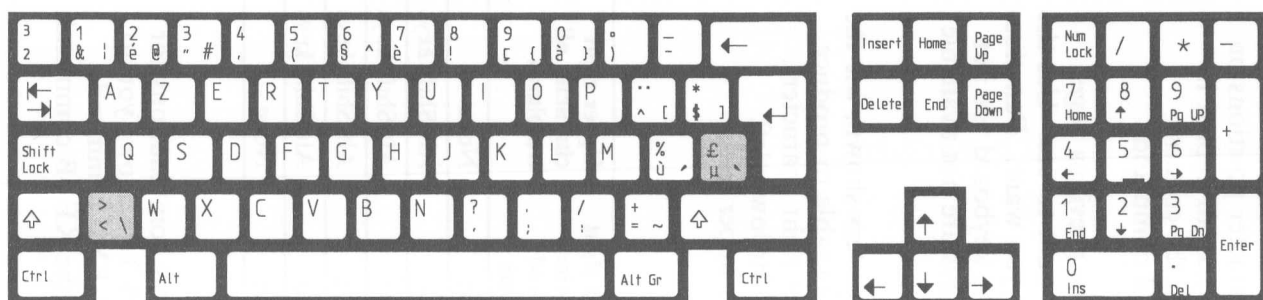
For keys with three or four characters shown, use the key combinations in the following table to produce the desired upper right and lower right characters. No additional keys are required for lower left characters. Use the shift key for upper left characters.

Country	Lower right character except enhanced keyboard	Lower right character enhanced template	Upper right character all templates
Canada (Fr.)	Alt-Shift keys	Alt-Gr.	None
Denmark	Alt	Alt-Gr.	Alt-Shift keys
Finland	Alt	Alt-Gr.	Alt-Shift keys
Norway	Alt	Alt-Gr.	Alt-Shift keys
Sweden	Alt	Alt-Gr.	Alt-Shift keys
All others	Alt-Ctrl keys	Alt-Gr.	None

Refer to Appendix D for dead key combinations for certain country keyboards. DOS 3.30 allows you to change the keyboard using the KEYB command. For additional information, see the KEYB command in Chapter 7.

# Belgium Enhanced PC

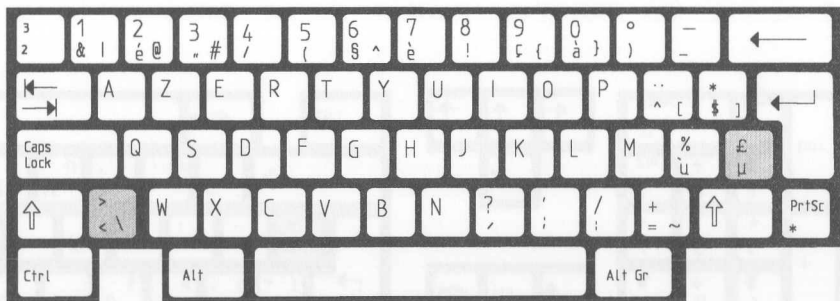
# Belgium AT



## Belgium XT



## Belgium Convertible

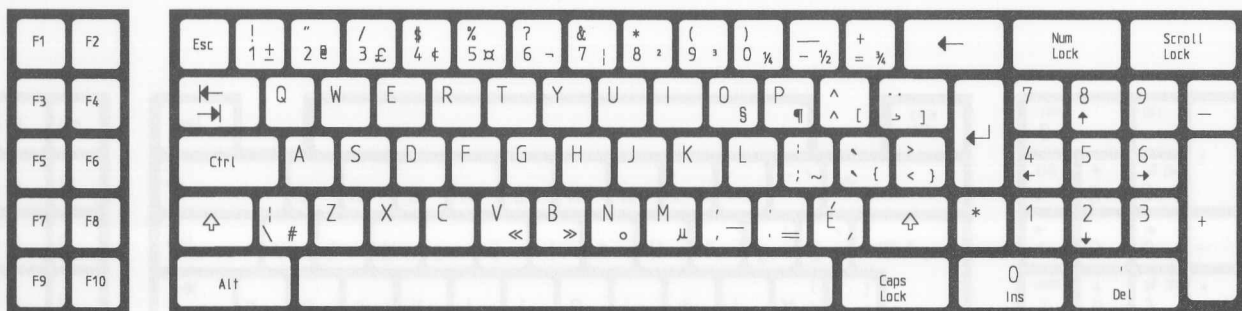


# Canada Enhanced PC

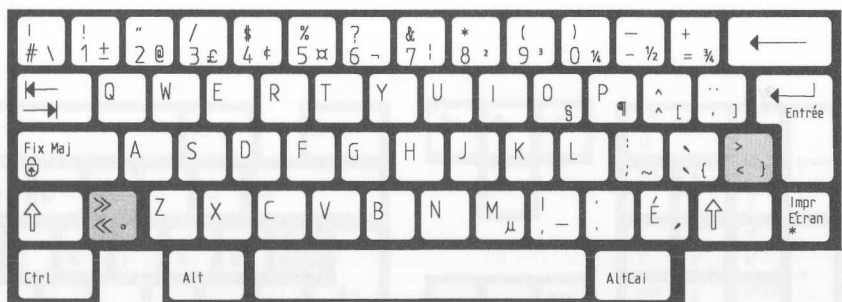
# Canada AT



## Canada XT



## Canada Convertible



# Denmark Enhanced PC

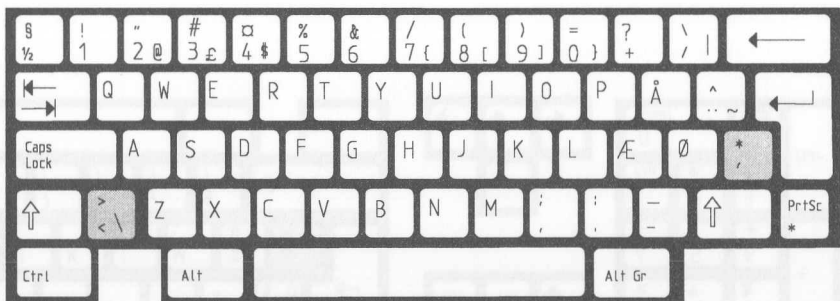
# Denmark AT



## Denmark XT



## Denmark Convertible



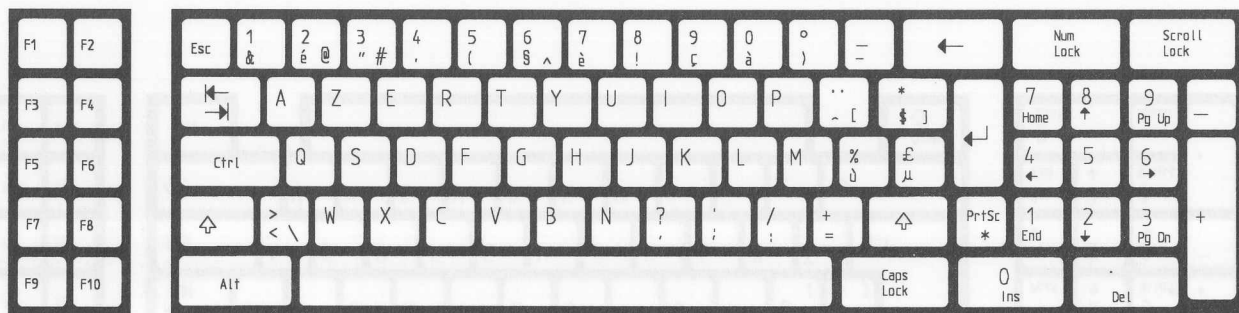
# France Enhanced PC

# France AT

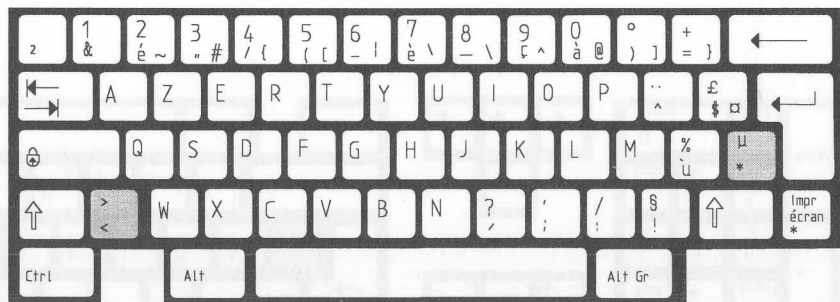




# France XT



## France Convertible



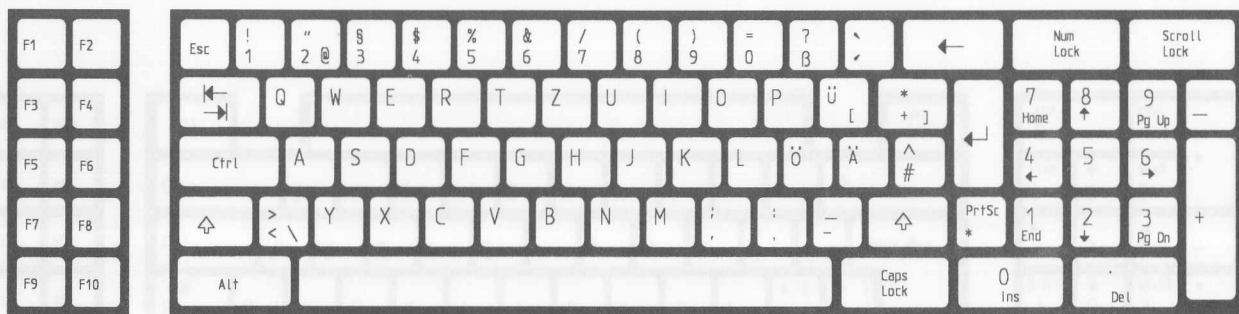
## German Enhanced PC



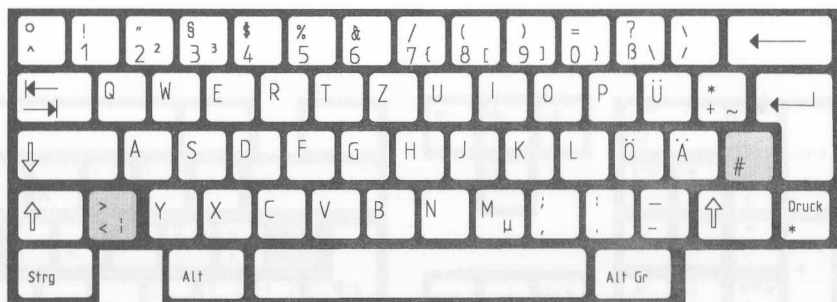
## German AT



# German XT



# German Convertible



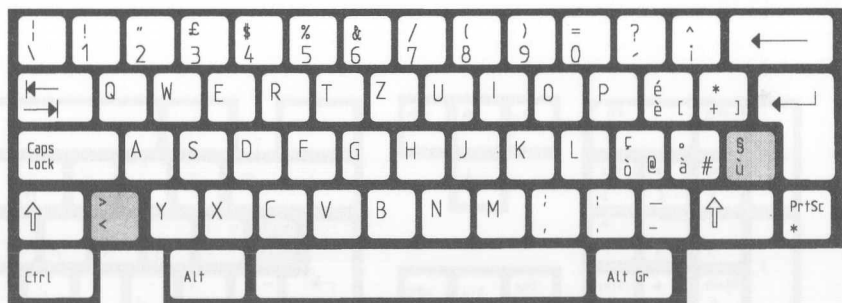
# Italy AT



## Italy XT



## Italy Convertible



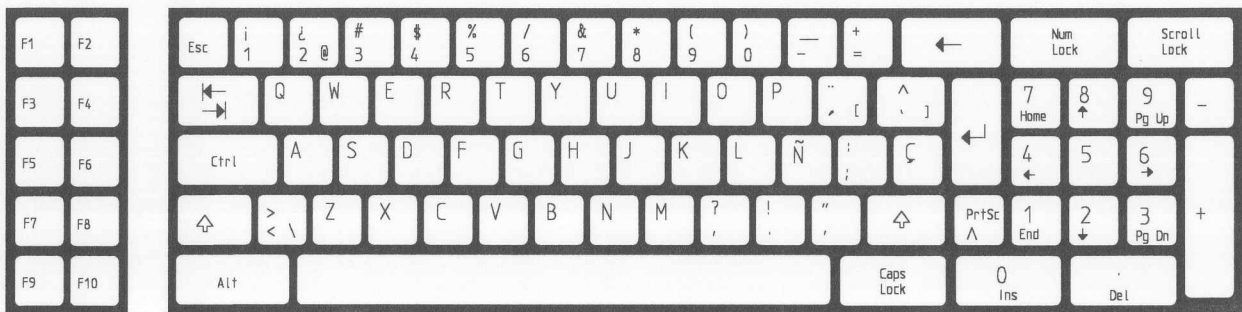
# Latin America Enhanced PC



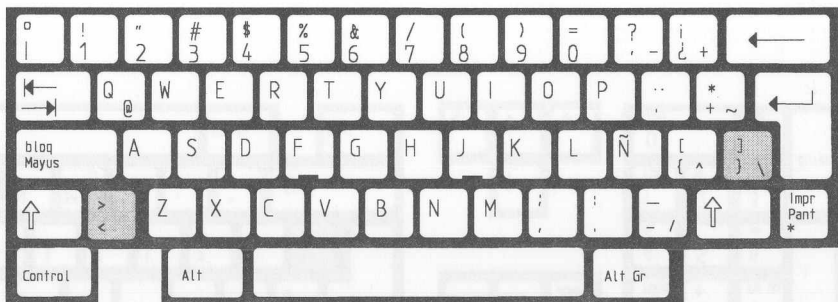
# Latin America AT



# Latin America XT



# Latin America Convertible



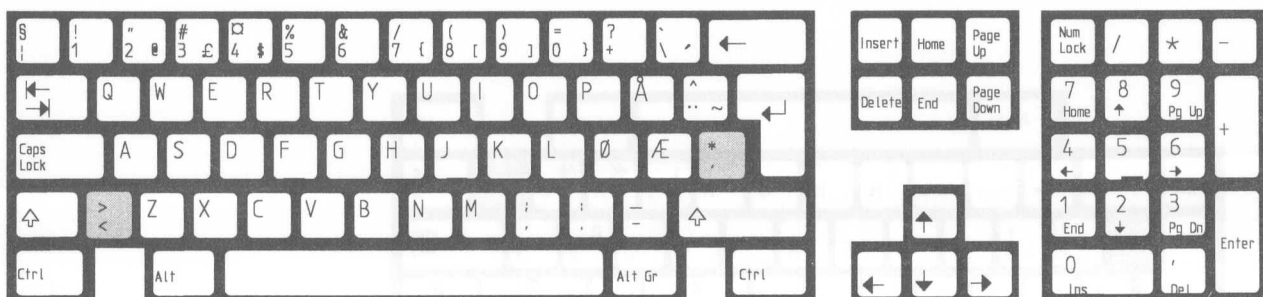
# Netherlands Enhanced PC







# Norway Enhanced PC



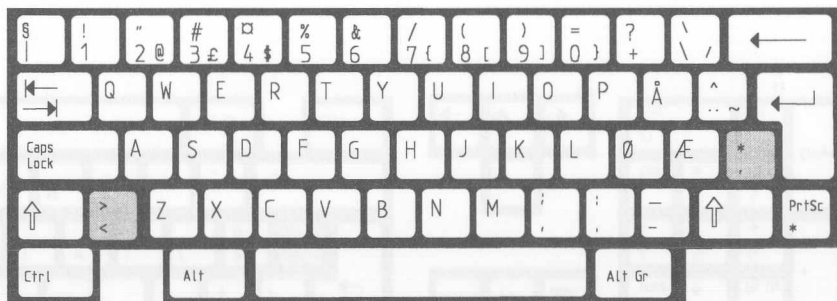
# Norway AT



# Norway XT



# Norway Convertible

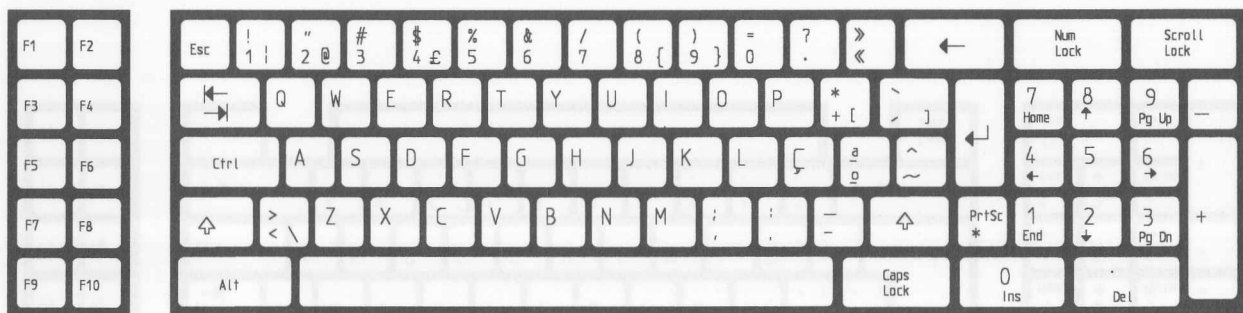


# Portugal Enhanced PC

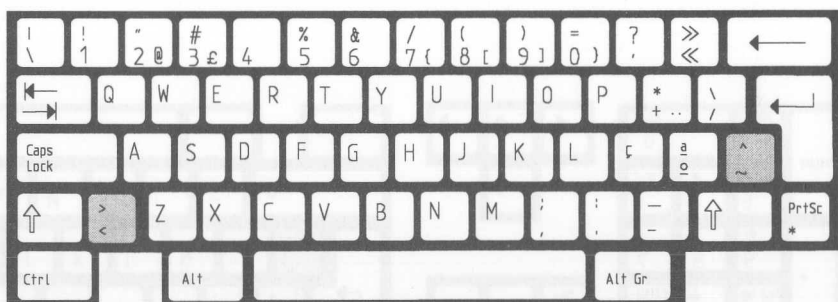
# Portugal AT



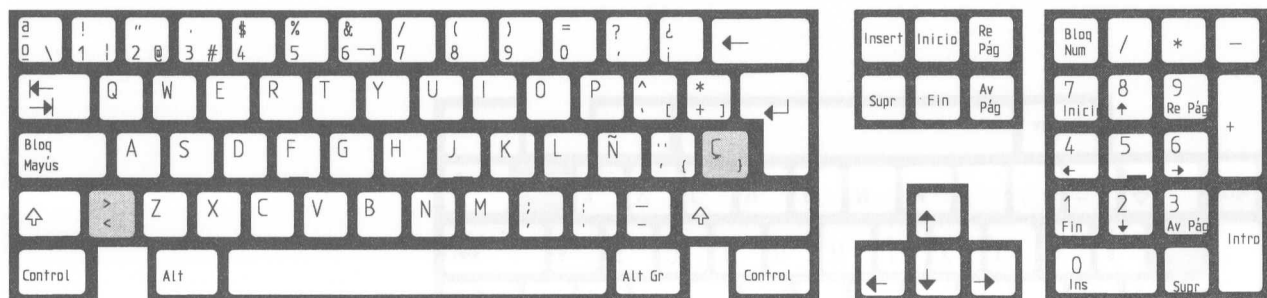
# Portugal XT



# Portugal Convertible



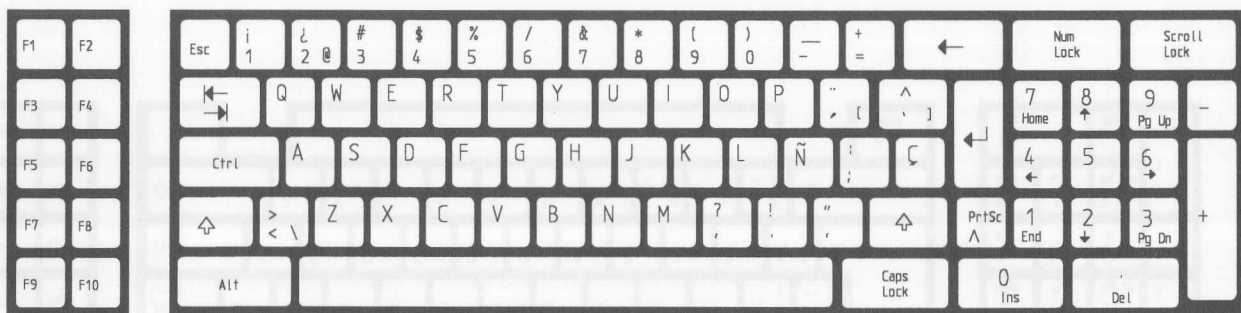
## Spain Enhanced PC



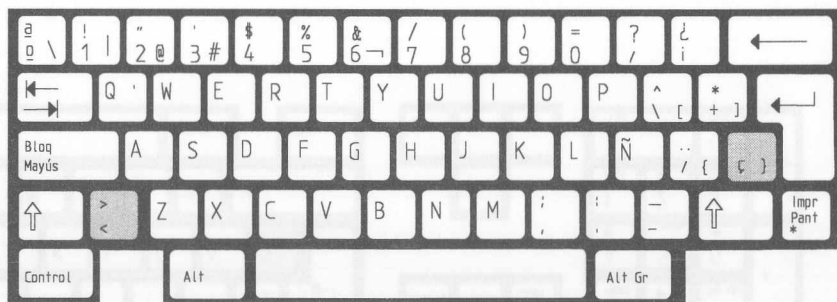
## Spain AT



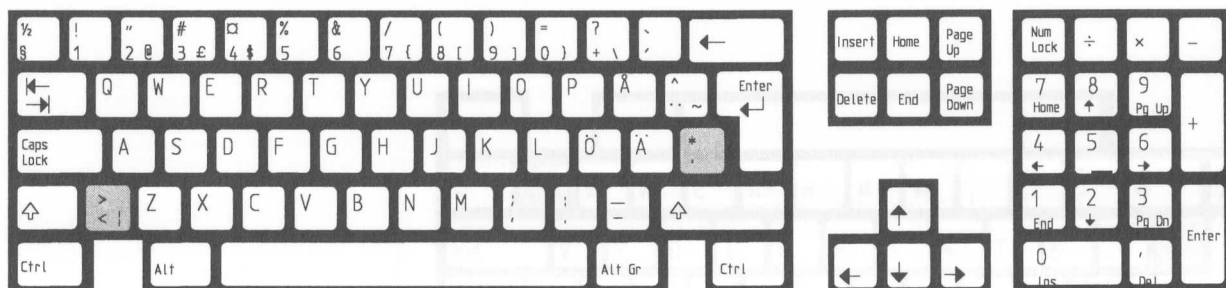
# Spain XT



# Spain Convertible



# Sweden/Finland Enhanced PC

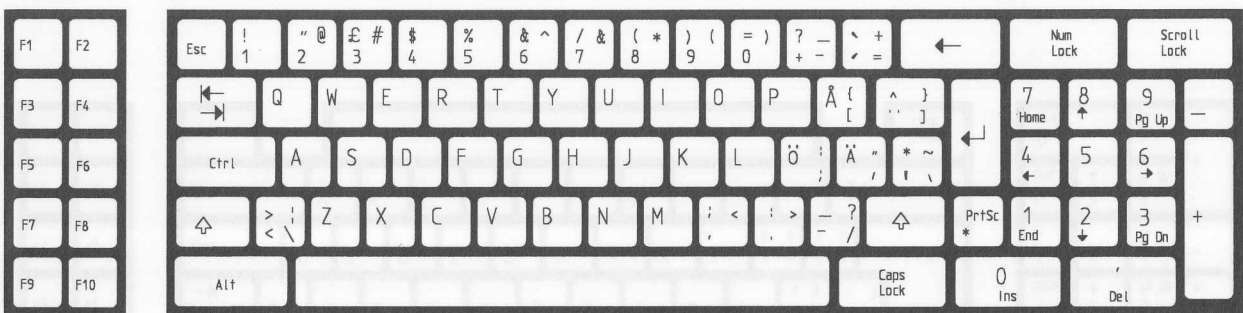


# Sweden/Finland AT

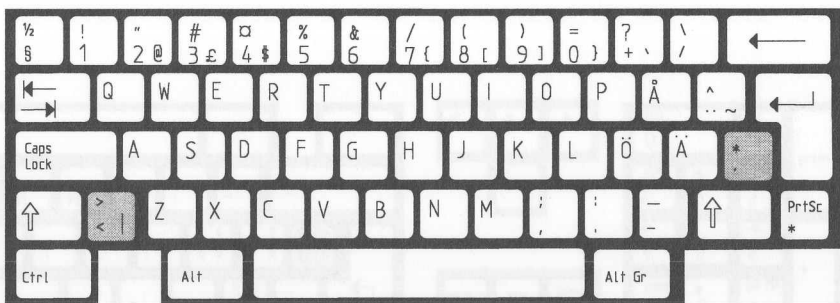




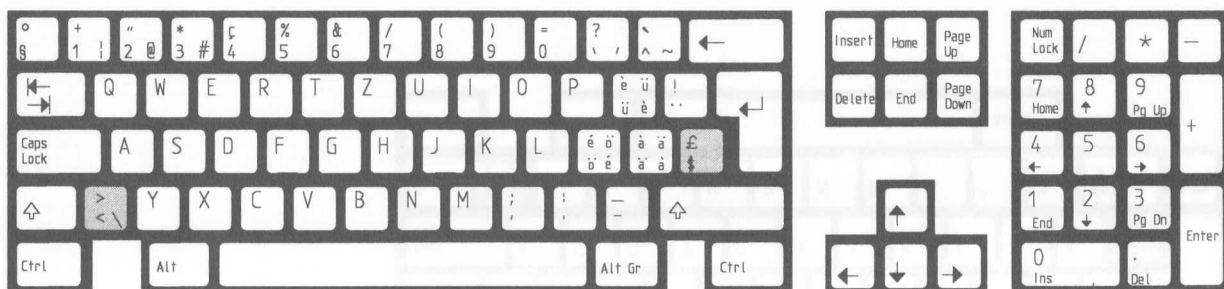
# Sweden/Finland XT



# Sweden/Finland Convertible



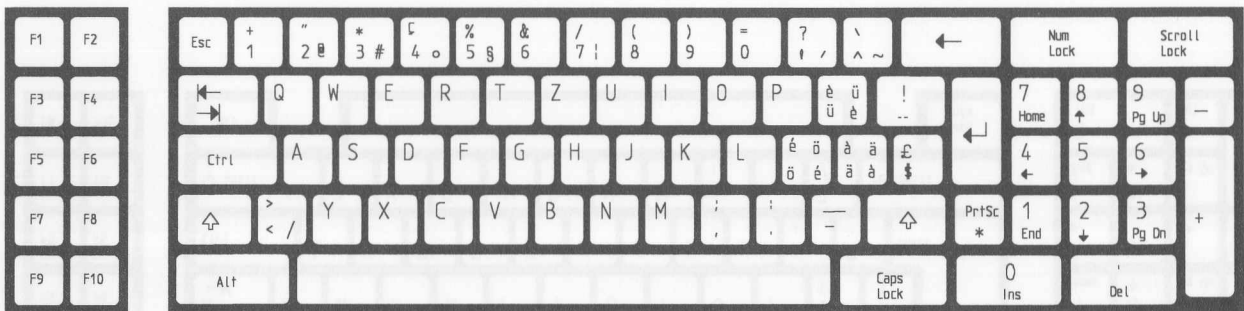
# Swiss (Fr./Gr.) Enhanced PC



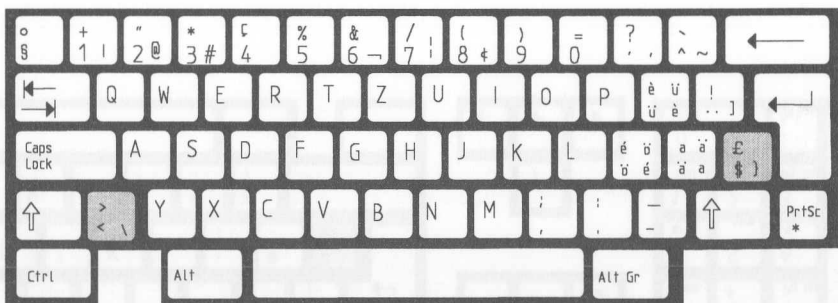
# Swiss (Fr./Gr.) AT



## Swiss (Fr./Gr.) XT



# Swiss (Fr./Gr.) Convertible





U.K. Enhanced PC



U.K. AT

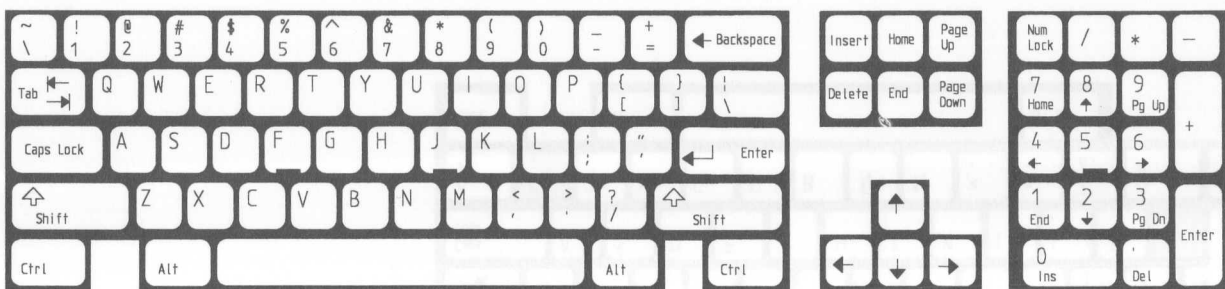
# U.K. XT



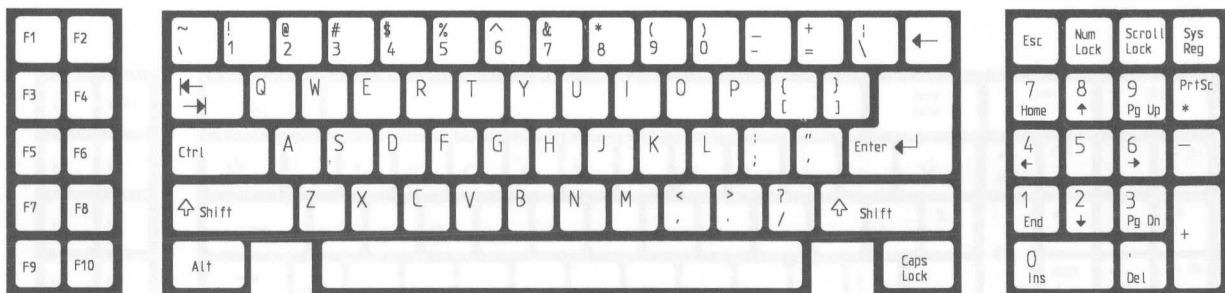
# U.K. Convertible



# United States Enhanced PC



# United States AT



# United States XT



# United States Convertible

